MEDICAL,

GEOGRAPHICAL, AND AGRICULTURAL

REPORT

OF A

COMMITTEE

APPOINTED BY

THE MADRAS GOVERNMENT

TO INQUIRE INTO THE CAUSES

OF THE

Epidemic Fever

WHICH PREVAILED

IN THE PROVINCES

OF

COIMBATORE, MADURA, DINDIGUL, & TINNIVELLY,

DURING THE YEARS 1809, 1810, AND 1811:

OF WHICH

Dr. W. AINSLIE *was President;*
Mr. A. SMITH, *Second Member;*
Dr. M. CHRISTY, *Third Member.*

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ADVERTISEMENT.

THE notice which this Report attracted amongst many of the most-respectable Servants of the EAST-INDIA COMPANY, of the Madras Establishment, and the flattering manner in which it was received by the Honourable the COURT of DIRECTORS, have induced the authors[1] to publish it. The subject is a melancholy one,—an inquiry into the nature of an Epidemic Fever, which was of several years' duration, occasioning the death of no less than 106,789 persons, and ruining the constitutions of many thousands.

Such epidemics, as that treated of in this Report, are not uncommon in our Indian dominions; and, as will be seen, have at

(1) Doctors *Ainslie* and *Christy* are the only Members of the Committee now living. Mr. *Smith* died two years ago.

different times been attended with the most unhappy consequences. While, therefore, the authors were led, by their immediate instructions, to make themselves acquainted with the particular state of the air, climate, countries, and inhabitants, which preceded and accompanied the calamity in question, they also, and of their own accord, added a Section, embracing what they conceived to be the most proper Medical Treatment for the epidemic in its various forms; and a subsequent one, containing observations respecting the measures that might be adopted, to obviate, as much as possible, the recurrence of so great a mortality. These divisions of a Paper now respectfully submitted to the Public, Doctors Ainslie and Christy are of opinion, may be useful to Gentlemen of their own profession, on their first arrival in India; and may perhaps prevent some of those errors in practice, too frequently committed by the young and inexperienced.

EDINBURGH,
June 1, 1816.

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AN INQUIRY

INTO THE

CAUSES

OF

THE EPIDEMIC FEVER,

&c. &c.

Section I.

A Geographical Description of the Provinces in which the Epidemic Fever prevailed; with some Account of their Climate in Healthy Seasons; of their Agricultural Products; and of the relative Condition of their Native Inhabitants.

The districts to which the attention of the Medical Committee has been particularly called, as those that have suffered most from the ravages of fever, are, Coimbatore, Dindigul, Madura, and Tinnivelly; comprehending an extent of country, in latitude about 3°. 30′, and in longitude, at some parts, nearly 1°. 35′; a tract stretching in length, from north to south, from the base

of the great southern ghauts of Mysore to the farthest extremity of the Peninsula; and, in its greatest width, from the vast chain of mountains which divides the two coasts, to Tondy on the Coromandel shore.

The Coimbatore province, under which are now included in one Collectorate, the divisions of Caroor, Sattimungulum, and Daraporam, may with safety be called an open country, when compared with many of those of our lower Indian dominions, although it is not without its woods[1] and partial wastes. It is bounded on the north and west by immense mountains; on the east by the countries of Salem and Trichinopoly; and on the south by the district of Dindigul. In extent, it may be reckoned, from north to south, about fifty miles; from east to west, nearly forty-five. Contiguous to the southern extremity of Mysore, it in

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(1) The Annimally woods, celebrated as being the haunts of wild elephants, lie towards the most southern and western parts of the Coimbatore country.

some degree partakes of its altitude, over all those lands which lie to the eastward and southward of it in the Peninsula; the average height of the plain being about nine hundred feet above the level of the sea, according to Major Lambton's measurement.

Coimbatore is watered by several rivers. The most considerable are the Cavery and Bawanie: the first of these has its source amongst the Courgh Mountains, which form a part of the western barrier of Mysore; and it joins the second at Bawanie. The Noel and Amberabady, with many rivulets, are also tributary streams to the Cavery; so that by the time the great conflux of water reaches Trichinopoly, this river has become one of the finest in India; and, as far as regards the purposes of cultivation, it has this advantage, that it is filled by both monsoons; by the S. W. in the months of June, July, and August; and by the N. E. in October, November, and December.

From its elevation, it may naturally be supposed that the soil of Coimbatore is in general dry; it is on this account particularly well suited for pasture-lands, and the rearing of the different dry grains; though there is, at the same time, no want of extensive tanks. In the vicinity of the hills[1], and in some other estates lying near to the Dindigul province, there is much low marshy ground.

About forty miles due west from Daraporam, there is an opening in the great mountains which run south; it is well known, by the name of the Paulcaudcherry Pass; and is in width, at its eastern extremity, about seven miles; and in length, at least thirty-one. This pass is shaped like a funnel, being much wider at the end which opens towards the Malabar coast, than it is at that by which it communicates with the district of Coimbatore; it is nearly on a level with the lands on

(1) Many of the villages of the Chuckragherry talook (division) lie close to the hills, in the neighbourhood of extensive marshes, and are proverbially unhealthy.

either side of the ghauts ; so that there is a free passage left for whatever wind may blow from Malabar, in a direction from N.W. to S.W. The distance from the eastern opening of this pass to the sea, at the nearest point, is about seventy miles.

The towns in the Coimbatore province are, in general, well built, and some of them are very large and populous. Four of the most noted are, Daraporam, Coimbatore, Bawanie, and Carroor. Daraporam stands in a fine, high, open country: the houses are, for the most part, well constructed; and it has the river Amberabady within about half a mile of it: it is nearly forty miles distant from the great mountains which run south, but is not more than fifteen from the Verapatchy, or Pilney Hills, in the Dindigul province.

Coimbatore[2] also stands high and dry, but is much nearer than Daraporam to the

(2) Coimbatore is in latitude 11°. 3′. N. and longitude 77°. 6′. E.

mountains which divide the Peninsula: it is, however, situated so far north, as to be clear of the Paulcaudcherry opening; which gives it a great advantage, with regard to climate and comfort, over the last-mentioned town, as we shall more particularly notice at a future period. It is neatly built; but its well water is bad, being brackish; and supposed, on that account, by the natives, to be the cause of cutaneous affections, which are common amongst the poorer inhabitants, who cannot afford to get supplied from the Noel, distant about a mile.

Bawanie stands at the conflux of the Cavery and Bawanie; and is, from this peculiarity of situation, much resorted to by the Hindoos, who consider it as a place of great sanctity. To the S.E. towards Sankerrydroog, there is a good deal of jungle (underwood), and rocky ground: to the southward, along the banks of the Cavery, lies a fine extensive, flat country; and to the N.W. are the rich and picturesque banks of the Bawanie. The town

is not so large as Coimbatore, but is well built, and, notwithstanding its peninsular situation, dry and comfortable.

Carroor is a large, handsome town, with wide regular streets: it is situated upon a gently rising ground, in a fine, dry, open country, and not far from the banks of the Cavery: it is very populous: its latitude is 10°. 54′. north; and it is at the great distance of seventy-four miles from the western ghauts, and thirty from the Pilney Mountains.

The Dindigul and Madura districts, together with the zemindaries of Sheva-gunga and Ramnad, being now comprehended in one Collectorate, we shall speak of them, with regard to certain particulars, conjointly. They occupy a space of territory of nearly one degree in latitude, and in longitude about one and three quarters; from the northern base of the Pilney Mountains to Verdapetty, in a southerly direction, and from the great ghauts to

Tondy (in the Ramnad division), from west to east: their most western tract is the Dindigul Valley, which extends from Dindigul, in latitude 10°. 12′. to Goodaloore, in latitude 9°. 35′. This valley is formed by the great mass of Pilney Mountains towards the north; by those which make the boundary of Travancore towards the west; and on the east, by a lower range of hills, which extend from Dindigul south to the bottom of the valley[1] near Shevagherry, where they unite with the great western ghauts. A projection from this range, commonly known by the name of the Aligherry Hills, stretches eastward, within about fourteen miles of the garrison of Madura. These hills are the nearest high lands to that fortress, and are washed along their northern base by the Vyar River, which is formed by several streams that have their sources in those hills bounding the Dindigul Valley, and which unite at Goolapooram, towards

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(1) The Dindigul Valley is in length about seventy-five miles; in breadth, twenty.

the mouth of the valley. The Vyar[2] then taking a S. E. direction, passes close to Madura; and after traversing the Shevagunga and Ramnad zemindaries, loses itself in a large tank, near Attangurry, twenty miles south of Tondy. There are other streams which run across the Madura district, and flow into the ocean betwixt Valiacondum and Vembar, in the gulf of Manar.

The Dindigul country may justly be called mountainous and woody, encompassed, as it nearly is, by high lands, all more or less covered with jungle, and which extend to the western ghauts. The villages are, in general, not so well built as those of Coimbatore: the floors of the houses are not sufficiently raised above the level of the ground; and the houses themselves, especially those situated amongst

(2) This river, which, on passing Madura, is of considerable size, is afterwards so diverted by artificial means, for the purposes of cultivation, that its bed at Ramnad is generally dry for the greatest part of the year.

the mountains, are often low, miserable, and badly thatched.

The principal towns of the Dindigul province are, Dindigul, Vedasunder, Pilney, and Perryacotah; but it will be enough for our present purpose to take some notice of that of Dindigul. This is situated towards the western extremity of an extensive plain, which, from east to west, is about thirty miles long; its greatest width, from north to south, twenty-five; and it is almost entirely surrounded by very high mountains. The town itself lies extremely low, within about six miles of the hills, which are directly south from it: the fort and fortified rock are close to it, towards the west; and the latter has at its base a large weedy tank. Dindigul is by no means so well built as some of the towns in Coimbatore. Before the fatal Epidemic, it was computed to contain upwards of seven thousand inhabitants; but now we do not suppose that the population amounts to half that number.

Those lands farthest from the hills in this district are invariably higher, and dryer, than others lying near their base; and many large morasses are to be found, particularly in the talook of Toddycomboo.

The general plain of the country is considerably lower than that of Coimbatore, though higher than those of Madura and Tinnivelly, and is about four hundred feet above the level of the ocean.

The Madura district is more open than that which we have just noticed; as it lies, in some measure, between the high Dindigul mountains and the sea, and has east of its meridian only the insulated hills of Towerincourchie and Cottampetty[1], which approach it within about sixteen miles, in a N. E. direction. We have observed, both

(1) This particularly applies to such situations as lie near the base of that projection of lower hills (before noticed) which advance from the Dindigul mass till within fourteen miles of Madura; for instance, the divisions Maudacolum and Aunyoor.

in this district and in that of Tinnivelly, that, at the distance of eight, ten, or fourteen miles from the mountains, the country is much higher, and drier, than it is farther west; where are often to be met with, marshy tracts, lying within a short distance of the hills, and rendering the villages in their vicinity extremely damp and unhealthy: there is much jungle in some parts, particularly in those nearest to the boundaries of Tondymans country. The high lands, which surround Towerincourchie, and, to a certain degree, Cottampetty, are covered with thick woods; and there is a great deal of low, fenny ground betwixt these two villages.

The general character of the Shevagunga zemindary is that of a dry country, having a light soil: it is much overrun with jungle; but, though flat, there is no cotton ground in it. The paddy lands are confined to the left bank of the Vyar, which is finely cultivated. Few tanks are to be met with, and scarcely any hills.

The zemindary of Ramnad has not a hill in it; it is by no means so dry as the last mentioned; and has, of late years, suffered much from the inundations of the Vyar, which are very unusual in common seasons. There are here and there tracts of cotton ground; and in the vicinity of Kilkerry, there are salt marshes, which communicate with the sea.

The towns and villages of the Madura district, though perhaps, upon the whole, better built than those of Dindigul, are many of them, particularly in remote situations, near the mountains, miserably constructed, and the houses badly thatched.

The four largest towns are, Madura, Trimmungalum, Cholavandum, and Nuttum.

The following description of Madura is taken from a Paper of the Third Number of this Committee, which was laid before Government by the Medical Board :—

"Its site is low, compared with the country adjoining: it is surrounded with a wet ditch, which, with several tanks within the fort, is filled from the river: in the immediate vicinity there are many tanks and rice-grounds, also supplied with water from the river. The fort is three and three quarters English miles in circumference: it was some years ago supposed to have contained forty thousand inhabitants; although now, from various causes, I imagine twenty thousand to be the utmost extent of its population: the inhabitants are, with a few exceptions, extremely poor, and their houses the most low and mean description of huts: the streets are narrow, filled with dirt and rubbish; and the old drains having been long since choked up, the rain-water stands everywhere in stagnating pools: thousands of cattle are kept within the walls, nor is there any regard paid to cleaning out the various description of filth, which is allowed to accumulate.

"The fort is also much crowded with trees, which, besides the bad effects re-

sulting from their decayed leaves, greatly retard evaporation; and the water in the tanks within the fort, being seldom renewed, is often putrid, and exhaling fetid vapours."

The Tinnivelly province is considerably lower than any of the others in which the Epidemic has prevailed; it extends, in latitude, from Verdapetty, in 9°. 41′, to Cookapootie, near the southern extremity of the Peninsula, in 8°. 7′; and in longitude, at its greatest width (from Collatore on the east coast, to Pooliery, at the opening of the Ariangowel Pass) about 1°. 15′. Its western barrier is the great range of Travancore mountains.[1] To the east and south it is bounded by the ocean, and to the north by the district of Madura. With regard to its elevation, it possesses the same variation as

(1) It may here be observed, that these immense ghauts are deeper, that is to say, broader in width, from W. to E. opposite to Palamcotah, than opposite to any other part of this district; a piece of information which we owe to Major Lambton.

is found to be general throughout the lower districts of India, increasing or decreasing as the lands lie farther from, or nearer to, the sea. The fort of Palamcotah, about three miles distant from Tinnivelly, has been ascertained to be about two hundred feet above the level of the ocean.

The district of Tinnivelly may, in the strictest sense, be called an open country, as few hills are to be found in it, and those insulated or detached: it however contains several waste and jungly tracts, especially towards the east, in the neighbourhood of Tutocorine; and in the Calcaud and Punj-mahl divisions, there are numerous palmyra-trees, growing in a sandy soil, and inter-spersed with patches of dry grain culti-vation: there are also here and there ex-tensive low and marshy lands, particularly in the vicinity of the mountains, and in the talooks of Bramadashum, Tencoushie, and Calcaud.

The same peculiarity is to be observed

in this, as in the Madura province; viz. that all situations lying at a certain distance from the hills are much higher and drier than those which are nearer to them;—a fact we had occasion, in several instances, to remark, on our journey from Madura to Courtalum (*viâ* Strivulputtore), as well as to note the consequences of it, but particularly with regard to the villages of Tewancootsie and Culpettie, in the northern part of the Streevulputtoor talook. The latter, standing in a fine elevated country, was comparatively comfortable, and the inhabitants healthy; whilst the other, due west from it, and close to the high lands, was found nearly surrounded with wet ground-damp, ruinous, and almost depopulated.

The principal rivers which water this province are, the Tambarapournie and Sytar. The first of these rises from a singular shaped mountain, amongst the Travancore ghauts, situated in latitude 8° . 35′; in which hill, Major Arthur of the Engineers informs us, no less than three other con-

siderable streams have their source, and run towards the west. The Tambarapournie[1], about twelve miles N. E. from its source, forms, by its fall, the well-known and famous Papanassum Cataract; after which traversing a rich and finely-cultivated country, it passes within a mile north of Palamcotah; where, pursuing its way in a N. E. direction, it is joined, at the distance of nine miles, by the Sytar: after which junction, changing its course to the S. E. it flows towards the ocean, into which it falls at Pinnacoil.

Previous to the conflux of the Tambarapournie and Sytar, the former is joined by several tributary streams. The latter, which is the smallest of the two, rises amongst the hills immediately north of Pooliery, at the eastern opening of the Airangowel Pass. Soon afterwards, it is united with several rivulets: the most remarkable of these is that which, by its Falls, creates the celebrated

(1) The Tambarapournie is about the size of the river Esk in Scotland.

Courtalum[1] Cataracts, and which rises in the mountains that form the southern side of a kind of recess, here produced by the retiring of the great ghauts, and distinguished for the singularity of its climate, particularly to be described in another part of this work: this recess is in width about twenty miles, and at its greatest depth, from its eastern opening, to the Ariangowel Pass into the Travancore country, about half that distance. The pass itself through the hills is very narrow, and may be reckoned in length, in a direct line, about ten miles: from its eastern extremity, to the western ocean, it is nearly forty.

Courtalum is not only the name of the Falls[2], but of a beautiful Sheva Pagoda, situated close to them, at the foot of the mountains. The Recess, or Valley, as it is

(1) Courtalum is in latitude 8°. 56′.

(2) The Hindoos suppose these Falls have the power of washing away their sins; and believe them to be under the immediate protection and sacred influence of Sheva.

called, has, of late years, been sufficiently cultivated; and the hills, which bound it on the north, west, and south, are grand and lofty. The scenery about the Pagoda and Falls is sublime and picturesque, and bears a strong resemblance to some of the most romantic situations in Switzerland, where wood and water, rocks and mountains, combine to aggrandize the landscape.

The greatest height of the lower fall or cataract is nearly two hundred feet. There are two others, formed by the same stream, higher up the mountains, and not less beautiful and interesting, though much more difficult of access.

Towards the southern and eastern extremity of the Peninsula there are many salt-marshes (*Turgas*): the largest of these are situated betwixt Coalsarpatnam in the Punjmahal talook, and Vesiapetty in Caulcaud; and are as follow:—

Moodoomutta, which lies about twelve

and a half miles s. w. of Manapar—Anacoodyérpoo, about ten miles s. w. of Manapar—Pootoor, about seven and a half miles s. w. of the same place; and Cunnoo, six miles s. w. of it—Vyravum, about the same distance—Soondencotah, nearly four miles west of Manapar; and Cootan, which is situated a short way from Moodoomutta. These marshes were formerly all distinct from each other; but, owing to the late inundations, four of them are now joined together; viz. Poottoor, Cunnoo, Vyravum, and Soondencotah; forming one great marsh, ten miles in circumference. They are separated from the sea by high sand-hills, have no natural communication with it, and lie at unequal distances, of four to thirteen miles from it. In common years there is not much water collected in them; but since the heavy monsoon of 1810, and more especially since the rains which fell out of season in February and March, they have been filled to a considerable depth (five, seven, or ten feet); and the water, by remaining long in a state of stagnation, has been productive

of infinite mischief. In December 1810, the inhabitants of the different villages which are contiguous to these briny swamps complained that their houses were rendered uninhabitable; that most of their cultivated lands were flooded; and that the water had risen so high on their palmyra-trees, that they were prevented from drawing toddy. To remedy these evils, Mr. Hepburn (Collector of the province) gave orders that a cut should be made from the four united marshes to the Curnyar River, which rises in the Calcaud Hills, with a view of diverting the superfluous waters from the deluged country: the cut was made, and for a time answered the purpose intended; but the subsequent rains in February and March last[1], unfortunately, by occasioning fresh floods and a new pressure, choked up the opening. Since that period, and from the time of the weather becoming drier, every exertion has been made to drain the country, and relieve the suffering inhabitants.

(1) March 1811.—See Date at the end of the Report.

Towards the extremity of the Peninsula, there is another pass into the Travancore country, known by the name of the Arumboolie Pass, and which, till lately, was the only one frequented by Europeans: it is about two miles in width, and not much more in length, through the hills, which here become very narrow. The eastern opening of this pass lies exactly in the meridian of Cape Comorin, and at the distance of twelve miles from it.

There are many large, flourishing, well-built towns in the Tinnivelly province; the chief of which are situated on the fertile banks of the Tambarapournie; such as, Tinnivelly, Alwar-Tinnivelly, and Culladacourchy.

Tinnivelly is an extensive, handsome, populous city, situated in latitude 8°. 43′. N. and about twenty-five miles east of the great mountains: it is in the Nelumbalum talook, about three miles west of Palamcotah, and is the capital of the pro-

vince: it is surrounded on three sides by extensive paddy lands, watered from the river, and on the west by dry rocky high lands.

Such, then, as we have described them, or nearly so, are the geographical boundaries and strongest features of the different provinces to which our attention has, on this occasion, been directed. We shall now proceed to say something of their climate, in common years.

Coimbatore[1], as might naturally be expected from its elevation, is colder and drier than some of the neighbouring countries: we have already remarked that the general plain of it is about 900 feet above the level of the sea; so that, if the theory of Dr. Black[2] be just, that for every two hundred feet of elevation we may reckon one

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(1) It is to be kept in remembrance, that the district of Coimbatore now includes the divisions of Caroor, Coimbatore, Daraporam, and Satimungalum.

(2) See Dr. Black's Lectures on Chemistry, vol. I. p. 103.

degree of reduced temperature, the district in question ought to have a great advantage, in this respect, over all those that lie lower and nearer the ocean.

The N.E. monsoon commonly commences soon after the calms are over, which takes place about the period when the sun crosses[3] the equator and enters on his southern declination (in other words, about the middle of October), and first pours its torrents over the Coromandel coast, in the vicinity of Madras, about the beginning of November[4]. This monsoon is evidently produced by the junction of the perennial east wind, and the cold air from the frost-bound regions of Thibet, rushing towards the south-west, to supply the place of that which has been rarified and sent upwards, by the influence of the sun on the east coast of Africa and the Indian Ocean.

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(3) The sun crosses the Line about the 22d of September.

(4) The rainy influence of the N.E. monsoon is observed gradually to extend from the north towards the south: it seldom reaches Tinnivelly before the end of November.

The rainy influence of the N.E. monsoon, which almost invariably attends the shifting of the wind to the N.E., seems, as far as regards the most southern part of the Peninsula, to be in a great measure confined to the districts lying east of the Balaghat mountains; which, from their great height and depth, attract and arrest many of those clouds, which might otherwise have been carried to the Malabar side of India by the N.E. wind. In such countries as are situated towards the north, as far as Cuttack, this monsoon would appear to be in like manner bounded, in some degree, by the great range of high lands which run south in the Peninsula, and at the unequal distances of twenty-five, twenty-eight, or fifty miles from the sea; in fact, the rainy influence of the N.E. monsoon may be said to be nearly confined to such territories as belong to the Madras Establishment.

In Coimbatore, the rains at this season (the N.E. monsoon) swell the rivers Noel,

Bawanie, and Amberabady, as also the Cavery (which, we have before remarked, is also filled by the s.w. monsoon); and at this period, too, the tanks and low grounds of the district receive their great annual supply of water.

The end of December, when the N.E. monsoon rains are over, and the sun has gained his most southern declination, may be considered as the coldest season of the year, in all those countries situated north of the Equator. In Coimbatore, at this period, the range of the thermometer, in the shade, is from 62°, to 80°, or 81°: the climate is then delightful; and the N.E. wind proves enlivening and bracing to weakly constitutions. Towards the end of January, and in February, the dews fall heavily; and the fogs in the morning, especially in situations near the mountains, continue sometimes till nine o'clock in the forenoon, occasioning simple intermittent fevers and catarrhs amongst the native inhabitants.

The N. E. wind prevails, with little variation, till the beginning of March; though it generally becomes weaker, the further the season advances. After this period, as the sun approaches the vernal[1] equinox, the winds are somewhat variable; and occasional calms ensue till he has gained about the seventh[2] degree of northern declination; when what is called the S. W. monsoon may be said to commence; and which appears to be occasioned, according to the notions of the Chevalier de Coudraye[3] and others, by the comparatively colder air, from the Continent of Africa and the Indian Ocean (which at this time have felt the absence of the sun), taking its course towards those extensive tracts lying in the N. E. of Asia, over which the air has become heated and displaced by the powerful influence of the solar rays. The early period of the S. W. monsoon is a season of great drought

(1) The sun crosses the Line about the 21st of March, on his northern declination.

(2) Which he does about the 7th of April.

(3) See his Theory of the Winds.

on the Coromandel coast; though partial rains are then experienced in Malabar, and amongst the western ghauts.

It must here be observed, that by the terms s.w. and n.e. monsoon, are not so much to be understood the rains which come from those points, as the particular winds which propel those rains: for we know that the n. e. monsoon, properly so called, continues long after its torrents have ceased to fall; and that the s. w. wind often ensues before the rains commence from the same quarter.

From the time that the sun passes the seventh degree, in his northern declination, the southerly[4] and south-east winds begin to prevail on the Coromandel coast, and continue till about the middle of May: in Coimbatore, and in other inland tracts, they are weaker and less unpleasant than at

(4) These winds are commonly called, on the Coromandel coast, *Long-shore winds.*

places closer to the sea, where, particularly near the period of their cessation, they are often warm[1], and to some constitutions extremely enervating. In the month of March, at Coimbatore, rain is very uncommon; the wind, though in the morning it still blows gently from the N. E, comes usually round to S. E, in the evening; and towards the end of the month, the N. E. wind, for the most part, dies away altogether; and with it, in regular seasons, those dews in a great measure disappear, which had fallen heavily during the two preceding months.

The sky in Coimbatore, in the month of April, is frequently overcast, but rain is not very common; at least, not to a greater extent than a few showers from the S. and S. W. The weather gets daily hotter, the average range of the thermometer for the

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(1) We must except, however, all situations south of Tanitary, or indeed Point Calamyre, where, by the training of the coast towards the west, the southerly wind is rendered less drying and unpleasant than it is farther north.

month being from 76°, to 93°. The wind continues to blow from the same direction as in the end of March, but oppressive lulls are often experienced. In May, the thermometer rises sometimes as high as 96°, and 98°, in the shade, and seldom falls lower than 79°; the sky is often overcast, and there are frequent disagreeable whirlwinds, which are quickly followed by pelting showers, accompanied with thunder and lightning.

The southerly, or what is called the *Long-shore wind,* generally terminates about the middle of May; when, owing to this part of the Peninsula having been so powerfully heated by the vertical[2] rays of the sun, a change takes place in the direction of the wind; which becomes general nearly all over India, and which brings on, before the rains begin to fall in June, by far the hottest season of the year.

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(2) The sun is vertical over Coimbatore about the 18th of April.

We have observed, that the sun crosses the equator about the 21st of March, at which period he commences his northern declination; and that, soon after, the wind begins to blow from the south: so that by the end of May he has been vertical over all those districts lying betwixt the southern extremity of the Peninsula and Coimbatore, which have of course been much heated: the consequence of this is, that the air which takes its direction from the now comparatively cooler regions on the eastern and southern coasts of Africa, rushes towards the tracts where the greatest rarefaction has taken place; and which, as we have seen, must, at this time, be the arid plains of the Carnatic. But this wind, passing over a great extent of heated country, will naturally partake of its temperature; and in this way is produced the hot west-wind, which continues to blow pretty regularly till towards the end of August; when frequent calms ensue, and light breezes from different quarters, the

evident consequences of the sun's again approaching the equator.

Soon after the setting in of the hot westerly winds on the coast of Coromandel, the rainy influence of the south-west monsoon is first experienced on the other side of the Peninsula, pouring its floods over Malabar and the Mysore country, and amongst the immense Balaghaut and western mountains; but it is but partially felt in the provinces lying east of these high lands. In situations near the hills, indeed, there are at this time frequent heavy showers, especially in the more western and southern parts of the Tinnivelly[1] and Madura districts; but excepting the Valley of Courtalum, no place that we know, on the east side of the mountains, can be said to be under the regular influence of the s. w. monsoon; and even here the expectations of the cultivators are, in this respect, often greatly disappointed.

(1) What is called the first burst of the s. w. monsoon often occasions heavy rains in Tinnivelly.

After the torrents, which distinguish this monsoon, have begun to fall in Malabar, the heat of the west wind on the Coromandel coast is usually a little moderated; but in the Carnatic by no means to that degree that we might expect: there, its temperature may be nearly calculated by the distance from the great western ghauts; as, the farther east we go, the greater becomes the heat of the air; the natural consequence of the wind having blown over a greater tract of arid land. In situations near the sea, however, much relief from the extreme heat is almost daily experienced, from the sea-breeze; yet we have known twenty successive days at Madras, during the land-wind season, without this great comfort, and which produced a state of the atmosphere almost insupportable.

After what we have said, it can easily be supposed that the west wind in Coimbatore, in May, June, July, and August, is by no means so distressingly hot as in situations lying farther east; but it is, at

least in some parts, fully as unpleasant from another cause—its immoderate strength. In speaking of the general appearance of this district, we mentioned the Paulcaud-cherry Pass into the Travancore country, which is in a direct line with Daraporam and Trichinopoly: this opening is of considerable width, and, being shaped like a funnel, with its narrowest end towards the east, allows a free and full passage to the west wind, from the time that it begins to prevail: for the first fortnight, this is comparatively weak, and a little warm; but from the commencement of June, till near the end of August, when the rains are falling on the Malabar coast, it becomes cooler, particularly near the hills, and sweeps over the tracts and in the line we have above mentioned, with great violence; so much so, indeed, at Daraporam, as to prove extremely unpleasant to Europeans, who are, during the time that it lasts, in a great measure prevented from taking exercise in the open air.

In the other parts of this district, out of the strong current of wind, the climate at this time is much more pleasant; such as at Coimbatore and Bavanie; the first of which stands clear of the pass, the other a great way to the westward and northward of it.

Were the great western mountains as near to the ocean, in this province, as they are in Tinnivelly, we have no doubt but that the rainy influence of the s. w. monsoon would prove considerable at the opening of the Paulcaudcherry Pass into the Coimbatore country; but as it is, there are only here experienced frequent scudding showers, which, however, have the effect of making the climate perfectly cool and agreeable.

The west wind, so refreshing near the opening of the pass, by the time that it reaches the eastern boundary of the Coimbatore country, is somewhat warm; and at Trichinopoly, where it blows with great

force, it would be almost as hot as at Madras, were it not for the extensive flooded paddy lands lying towards the west of that city, and the swoln river Cavery, over both of which it passes.

A good deal of rain usually falls in the eastern part of Coimbatore in the month of June; but in the more western tracts, near the hills, the quantity at the same period is much more considerable: there are scarcely any dews, the sky is often overcast, and the temperature of the air towards the end of the month is somewhat lower than in the preceding one: the nights are pleasant, and the Cavery, for the most part, fills about the 12th or 15th, from the s. w. monsoon torrents in the upper countries. In July, nearly the same kind of weather prevails as in June; only that, in the first mentioned month, there is a little more rain than in the last. The range of the thermometer is commonly betwixt 75° and 91°.

About the middle of August, in this

province, the west wind becomes much more moderate, and there are frequent heavy showers and occasional thunder-storms: soon after this, most oppressive lulls are experienced, and the evenings and nights become hot and close. Towards the end of the month the river almost invariably fills, and gentle airs now and then blow from the southward.

In September, the wind is variable, but the westerly still predominates. That sultry and close weather, which constantly, in inland situations in India, takes place as the sun draws near to the equator, is now felt: the evenings are most unpleasant, and the insects very troublesome. There are occasional showers from different quarters.

The weather in October, in Coimbatore, is for the most part similar to that of the month preceding; and though rain occasionally fall, the air is often close and sultry: the winds are light and variable, and the insects very troublesome.

It has already been observed, that about the middle of this month the N. E. monsoon commences, and that at the same time its rainy influence is first felt in the northern tracts of the Coromandel coast; but the rains do not usually reach Coimbatore sooner than towards the 6th or 8th of November, and are generally over by the end of December, about which time the delightful cool weather begins, with heavy dews.

We have said before, that this province was, from its nature, peculiarly well suited for dry grain cultivation: the proportion of which, over that of rice, is so great as 97 to 3. The different grains, pulses, &c. here produced, are the following:—— Rice (*Oryza*); Cumboo[1] (*Holcus spicatus*); Chōlum (*Holcus saccharatus*); Natchenny (*Cynosurus coracanus*); Warragoo (*Paspalum frumentaceum*); Ténny (*Panicum Italicum*); Sāmay (*Panicum miliaceum*); Wheat

(1) Except that of rice and wheat, the common names given here to the grains are the Tāmool names, by which they are usually sought after by the English.

(*Triticum*); Ulandoo (*Phaseolus Mungo*); Carp or Black Ulandoo (*Phaseolus Max*); Coolloo (*Glycine tomentosa*); Towary (*Cytisus Cajan*); Caramunnay (*Dolichos Catjan*); Panny pyre (*Phaseolus radiatus, var.*); Totta pyre (*Dolichos Lablab*); Cádálay (*Cicer arietinum*); Muchacottay (*Dolichos Lablab, var.*); and Coodraywalie Samay (*Panicum semiverticillatum, spec. nov. Rottler*).

Great general comfort appears to be enjoyed by the native inhabitants of this district; which was witnessed by us in our visit to it, during the months of May and June last. The houses are, for the most part, well raised; and their roofs being made to slope much, they are little liable to suffer from heavy rains.

We found, as was noticed in our letter to the Medical Board of date the 17th of May 1811, that the cultivators in general lived[1] well; that most of them slept on

(1) As might be supposed, from the nature of the cultivation of this province, the most common food of the labouring people

cuttles (truckle-beds), and had *cumblies* [2] to cover them; comforts which seem to have existed from the time that the Coimbatore territory was under the dominion of Tippoo Sultan, who was extremely particular regarding such matters, owing to the bleak air and dampness, of the greater part of the countries over which he reigned, having frequently proved prejudicial to his people.

Upon the whole, Coimbatore may well be called healthy; though there is, no doubt, (as there must be in all such provinces of the Peninsula as are in any degree mountainous,

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people is dry grain, of some kind or other; or pulses, of which there is a great variety; and many of them have been long ascertained to be extremely nutritious. The affluent, of course, eat more rice and *ghee* (clarified butter), and, as in other parts of the world, enjoy those comforts and luxuries, in respect to diet, which the poorer inhabitants cannot afford, and who are sometimes, on this account, led to prepare for themselves crude and unsalutary mixtures, with some of the worst kinds of greens or fruits, and butter-milk.

(2) Coarse blankets.—The sheep of Coimbatore, unlike those of other parts of lower India, have a kind of coarse wool upon them, from which these blankets are made.

or bounded by mountainous tracts) danger attendant on going amongst the high lands at certain periods of the year, where fever is known to be endemic[1].

The climate of the Dindigul district, in common seasons, is reckoned one of the finest in India; so much so, indeed, as to have become proverbial. The temperature during the months of December and January is not in general quite so low as it is in the more northern parts of Coimbatore; the thermometer seldom falling below 64° in the shade. In February, the dews are heavy, and the morning fogs extremely dense: the southerly and S. E. wind, which blows towards the end of March and in April, is here by no means so unpleasant as it is nearer to the coast; and is sometimes pretty strong about the middle of the last-mentioned month, by which time the dews are nearly over, and the sun[2] vertical over

(1) Such as it is amongst the mountains near Satimungulum, in March and April.

(2) The sun is vertical at Dindigul about the 17th of April.

Dindigul: oppressive lulls[3] are occasionally felt.

It seldom rains in March and April. May may be considered as the hottest month of the year; though the thermometer does not usually rise so high here as in the Coimbatore and Madura districts: and the air is now and then refreshed with showers, attended with thunder; by which means the west wind, when it begins to blow, is rendered much less scorching than at many other places. But it is in June, July, and August, that the superiority of the climate of Dindigul in regular seasons is chiefly experienced. Owing to the number of detached hills which are scattered over, and distinguish this province, much rain falls during these months; the natural consequence of the clouds they attract,

(3) These lulls are peculiarly distressing at this season of the year, in what is called the Dindigul Valley; which, from its situation, has a climate much resembling the "Vallais" in Switzerland, bounded on one side by the Alps of Savoy, and on the other by the most mountainous tracts of the Canton of Berne.

and the frequent and rapid interchange of the electric fluid: in this way the sky is often overcast, and the temperature of the air rendered cool and pleasant. During the remainder of the year, the climate of Dindigul does not materially differ from that of Coimbatore. Several of the pulses we have mentioned, as growing in the last-mentioned province, we could not find in the Dindigul country, which leads us to think that they are not common; neither did the Wullawahs (labourers) in this district, who are chiefly Pullars, seem to be so comfortable in some respects, chiefly in regard to lodging. Their houses, unless in a few of the largest towns, such as Vedasundoor and Pariacolum, are frequently small, badly built, carelessly thatched, and but little raised from the level of the ground; especially those of the villages near the hills, in which there is often an appearance of misery and squalid poverty to be met with; in a great measure, perhaps, owing to their unhealthiness, and the uncomfortable nature of their situations.

Cuttles are less used here than in Coimbatore; indeed they are seldom seen, unless in the dwellings of those in rank above the labourers; such as, the Marasidars, and superior sort of inhabitants; although timber is by no means scarce. *Cumblies* are, however, almost in general use; indeed we believe that they are manufactured in some of the eastern estates, and are certainly a great source of comfort in a hilly country, where the dews fall heavily, and the fogs last long.

The number of *cawnies* cultivated with *punjeh*, or dry grain of all kinds, in the province we now speak of, is 123,259 *cawnies*, 5¾ *as*. Those under Nunjeh or Paddy[1] cultivation amount to 28,063 *cawnies*, 14½ *as*; which gives a difference in favour of punjeh or dry grain, of 95,195 *cawnies*, 7¼ *as*; the particular food of the inhabitants will of course depend much on the situation of the village they inhabit, whether connected with a dry or a wet culture; a part of

(1) Rice.

the produce of which is given to the husbandmen as a price of labour, together with a small sum of money for clothing.

The climate of the Madura province differs in some respects from that of Dindigul; the country is lower in the Peninsula, is a little farther south, and is not so mountainous: the natural consequence is, that it is hotter in the hot season, and not quite so cold in the months of December and January. In April and May, the extreme degrees of temperature betwixt the morning and noon are 79° and 98°. In January the thermometer seldom falls below 66° at sunrise. Rain is rarely seen in February; but a few showers occasionally descend towards the end of March, with whirlwinds, clouds of dust, and thunder; about which time the N. E. wind becomes very faint, and there are gentle airs from the south and S. W. In April, the same kind of weather prevails that we have mentioned to be then prevalent in Coimbatore; with this exception,

that showers are here a little more common, and come from the w.[1] and s. w.

The s. e. winds now and then lull[2]; and the most oppressive calms ensue, with frequently a smart thunder-storm in the evening, accompanied with rain from the n. w. This is by far the most unpleasant time of the year in the province, especially within the Fort[3] of Madura, which lies extremely low, crowded with houses, and nearly choked up with trees. Towards the

(1) About the full moon of the month of April, the river Vyaar, the bed of which has previously been dry, is invariably partially filled by rains which have fallen amongst the western mountains, from the period that the s. w. monsoon had commenced; and on this circumstance the natives calculate, with certainty, for the replenishing of their tanks, and enabling them to perform their various ablutions at the festival of the Aligherry God; which is annually held, on the banks of the river, at this season of the year.

(2) These oppressive and unhealthy lulls are particularly experienced in that valley in which Towerincourchie stands; and which is nearly surrounded with hills, covered with trees and jungle, and distinguished by its rank vegetation.

(3) The sun is vertical at Madura about the 16th of April.

end of March, the inhabitants of Madura are in the habit of visiting the sea-coast at Mootapetty, in the Ramnad zemindary, which, from its peculiar situation, proves at this season of the year a cool residence[1]. By its having the ocean towards the south, the southerly wind is rendered a sea-breeze; and by having the Bay of Kilkerry lying due west of it, the west, or Land-wind, as it is commonly called, must also become a sea-breeze. The sea-port of Daviapotam, which is nearly opposite to Mootapetty, on the other side of the peninsular neck of land, becomes, from its position, a more desirable retreat during the N. E. monsoon.

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(1) The second Member of this Committee, having been under the necessity of proceeding to Mootiapetty from Madura, about the end of June, for the recovery of his health, which had suffered much from an attack of the epidemic fever caught during travelling through the unhealthy districts, wrote as follows to Dr. Christy:—

"We have not felt a single hot hour in our tents since "our arrival at Mootapetty, where a sea-breeze blows night "and day. I look upon this as one of the best points of "the coast for any person to come to, either for the recovery "of health, or the enjoyment of every thing of or belonging "to the sea."

In the beginning of May, the west wind in the Madura province, though by no means so hot as in the Carnatic, is somewhat warmer than at Dindigul. In June, July, and August, there are frequent refreshing showers, particularly in the two first-mentioned months; the consequence, as well of those clouds which have been attracted by the Aligherry and Nuttam hills, and may be considered as the certain offspring of Coromandel exhalations, as of others which may have been driven by strong west winds from the great western ghauts, and which are as certainly the produce of the s.w. monsoon.

September and October differ but little from the same months, in other parts of the eastern coast of the Peninsula; being, almost invariably, close, sultry, and unpleasant.

The N.E. monsoon extends to the Madura district in common with other parts of the Coromandel side of India; but in

inland situations the rains fall more gently than they do near the sea, and are not accompanied by such strong winds: about the middle of November the tanks are generally full, and the Vyaar is impassable at Madura for many days.

Every thing considered, the climate of this district cannot, in common seasons, by any means be called unhealthy; though the fort itself has certainly been so for several years past, even before[1] the present epidemic prevailed; a misfortune which we conceive may be entirely attributed to those causes and localities pointed out by the 3d Member of this Committee (in his Paper addressed to the Medical Board), and which are certainly sufficient to produce fever in any quarter of the world, and in the finest seasons.

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(1) In March 1801, an army, at that time under the command of Colonel Agnew, amounting to 5000 men, were encamped on the glacis of the Fort of Madura, and were remarkably healthy, while the inhabitants within the garrison were dying at the rate of fifteen and twenty daily.

In the district of Madura, as in every mountainous country of the torrid zone, there are situations where fever never fails, at certain seasons, to be endemic: but then, at such places, in common years, it is simply so, and extends not its malign influence beyond their particular range. An intelligent native of Madura informed the President of this Committee, that, to his certain knowledge, there were villages close to, and others amongst the hills lying in the most western parts of the province, in which, in the months of March and April, scarcely any person, particularly a stranger, could pass a single night, without suffering, in a few hours after, from an attack of fever.

The relative condition of the native inhabitants does not appear materially to differ from that of the cultivators of the Dindigul district.—Along the banks of the Vyaar, and in the Shevagunga zemindary, there is a great deal of paddy[2] land; and, of

(2) Rice in the husk is called Paddy.—The number of

cawnies

course, in such tracts rice is commonly eaten. In other quarters, the dry grains are the usual food, especially Wárragoo, Cumboo, Cholum, Natchenny, and Sāmay. We found the pulses not so much cultivated here as in Coimbatore: indeed, several of those before enumerated, in treating of that district, were not to be seen in the Madura province.

The Marrawas do not seem to be at all conspicuous for neatness or comfort in their dwellings; unless it be in some of the large towns, such as Sholavandum and Nuttum. Their houses are but indifferently built, little raised above the level of the ground; and the thatch is often of a bad kind, and carelessly put on. *Cumblies*, which are much used in Dindigul, are in this province scarcely known; and *Cuttles* (truckle-beds), among the lower orders, are rarely met with; so that a bleak and moist season here exerts its unsalutary influence most severely,

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cawnies under paddy cultivation, in the Madura district, is 34881 *cawnies*, 11¼ *as*: the number under that of dry grain, 102,658 *cawnies*, 13 *as*: which gives a difference, in favour of the dry grain culture, of 67,777 *cawnies*, 1¾ *as*.

especially on the poor, whose meagre and haggard looks are at such times so many testimonies of the mischief that certainly springs from an exposure to cold and damp; and afford a sad warning of the still more serious evils that would certainly arise, under such circumstances, from the supervention of an epidemic condition of the atmosphere.

The climate of the northern part of the Tinnivelly province has a great resemblance to that of Madura; whilst towards the centre, on the fertile banks of the Tambarapournie, and in its more southern tracts, it assumes a somewhat different character.

The N. E. monsoon seldom reaches Tinnivelly before the end of November, and is, in general, by no means so heavy as in the Carnatic. The rains are over about the latter end of December; but are not succeeded by so cold a state of the atmosphere as is experienced in the Coimbatore and Dindigul territories; the thermometer seldom falling below 69°, or 70°, at sun-rise.

The Tinnivelly country is peculiar in this respect, that a fall of rain is always looked for late in January, in quantity sufficient to bring down the rivers and replenish the tanks.[1]

Towards the end of February, the weather begins to get warm; and in March may be reckoned sultry, with a great deal of clear sun-shine. Rain is seldom known to fall in these months; and, in the latter, the thermometer occasionally rises as high as 93° or 94°. About the beginning of April, which is also a hot month, the southerly wind commences, and continues till late in May; during which period rain is not very common, though there is now and then a smart shower, attended with thunder. About the end of May, or early in June, the south wind ceases; and the first burst of the south-west monsoon usually breaks with violence, pouring its torrents amongst and over the great ghauts, bringing down the rivers, and

(1) These, in Tinnevelly, are generally small.

deluging the low country. June, in consequence of these rains, is a cool cloudy month. In July, August, and September, the west wind blows with great force, and there are occasional showers from the same quarter: this wind becomes warm when there are many successive days without rain; but by no means to so great a degree as in situations lying farther north in the Peninsula, where the land from sea to sea is much wider, and where, of course, the west wind must naturally be more heated.

October is almost invariably sultry: it is true that showers now and then fall, but they have not the effect of cooling the atmosphere; and towards the end of the month there are occasional light airs from the N. E.; though the rainy influence of the N. E. monsoon is seldom felt till towards the end of the succeeding month.

The cool retreats of this province are Courtalum and Trichindore. Early in June, after the heavy rains of Malabar have

commenced, is the proper time to visit the former: the climate is then truly delightful to the feelings of Europeans, and continues so till the middle of October.

Owing to the great depth[1] of the Courtalum Valley, as already described, it approaches so much nearer to the Malabar coast than other situations along the course of the hills, that those clouds, which under other circumstances would have expended their waters amongst the immense mountains, here pour a great part of their rains; extending to this recess, in a considerable degree, the climate of Malabar: with this favourable exception, that it is not at this time by any means so damp[2], notwithstanding the very luxuriant vegetation which is

(1) See the geographical description of this recess or valley, in a former part of this Paper.

(2) It is a curious and singular fact, that, in this valley, though rains are falling, there is no feeling of dampness within doors, such as we experience in the Carnatic during the N.E. monsoon; and iron and steel remain without rusting, for a very long period.

seen in every direction, and the showers that fall daily, attended with a strong, cool west wind.

The difference of the thermometer betwixt Courtalum and Palamcotah is, in general, about 10°; that is to say, while in June or July the temperature at the former is 75° at 7 A.M. and 79° at 2 P.M. it is at Palamcotah, at the same hours, 85° and 89°: so that, during the hot weather at the last-mentioned station, the feeling of comfort experienced on quitting it, and visiting this charming retreat, is wonderful. Such is the bracing effect of the cool air here, that exercise can be taken without doors at any time of the day, and amusements pursued with as much pleasure as in England, as the sky is almost constantly overcast; and if a person does by chance get wet in a shower, there is no danger of his taking cold in consequence, so great is the natural dryness of the atmosphere.

What conduces much to the restoration

of invalids at this singular abode, is the little water-fall, under which most of the Europeans daily bathe. This cataract is, by a division in the rock above, separated from the greater one; and is not more than thirteen or fourteen feet high. The falling of the water, after the first shock is over, gives an undescribable feeling[1] of pleasure: by its constant beating, it quickens the circulation, and produces a fine glow all over the body; and has, besides, the further good effects, of dispelling languor, raising the spirits, exciting appetite, and promoting digestion, in a superior degree to any other kind of bathing that we are acquainted with. It has, in consequence of these virtues, together with the delightful climate of the valley itself, been the happy means of rapidly restoring many to health and comfort, who, previous to their visit to Courtalum, appeared to be hastening to their graves.

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(1) The average temperature of the water of the Fall, at 8 A.M. during the bathing season, is from 72° to 75°.

But it will be necessary to remark, before taking leave of this wonderful recess, that, however excellent may be the climate here in the months of June, July, August, and September, it is far otherwise during those of February, March, April, and May. Partaking as it does of both monsoons, there is much rank vegetation in it; but, from its singular topographical position, it is altogether, or in a great measure, deprived of the salutary influence of the southerly winds, which alone, at this season, could purify the air, distempered as it then becomes by much moisture and unventilated jungle: the consequence of this is, that, in the last-mentioned months, the valley is hot and sultry to the greatest degree, and never fails to be most unhealthy: indeed, endemic fever, at such times, is as certainly met with here as at Gambia or Senegal.

This peculiarity in the climate of the Valley of Courtalum we particularly beg leave to impress upon the minds of our

readers, as it bears an exact resemblance to that which shed its malign influence over the southern provinces of the Peninsula about the end of 1810, and during the first months of 1811; when unusual rains occasioned inordinate moisture, and the deficiency of the southerly wind produced stagnation and morbific miasma.

Trichindore is a situation on the sea-side, about thirty miles east of Palamcotah: it is resorted to in the months of March and April, for the benefit of the sea-breeze, and change of air; but it is inferior to Mootapetty, in many respects; which may easily be discovered, on referring to the singular advantage of that place, already noticed.

The district of Tinnivelly has certainly many things to recommend it, in point of climate. The N. E. monsoon is here mild: in March, April, and May, the only unpleasant months of the year, the sea is near to resort to: and for the sick and

infirm, who may not find Palamcotah suited to their feelings or constitutions, in June, July, and August, there is Courtalum, at no great distance, to fly to for relief.

The natives in this province seem, in general, to enjoy greater comforts than in some others that we have mentioned: their dwellings are, for the most part, well raised, and neatly built, particularly in such towns as lie along the fertile banks of the Tambarapournie river; where tiled houses are common, and the streets wide, regular, and clean.

In the northern and western tracts of the Streevulputtoor talook, however, especially in those estates lying nearest to the hills, hamlets of a very inferior order, both as to building and thatching, are often met with: situated in low and moist bottoms, they cannot be otherwise than damp and unhealthy; and the houses in such places being neither built in regular streets, nor joined together so that each man might

in some degree partake of the drying influence of his neighbour's fire, they, like others similarly circumstanced in the Madura province, are but too often the abodes of a gaunt and meagre race.

Cumblies are little known in this part of India; and *cuttles* are only used by the more affluent.—From the Paddy[1] cultivation being so much greater than that of the dry grain in Tinnivelly, it follows that the inhabitants eat more rice than in some other districts. In the rich and beautiful villages situated in many parts of this country, a great variety of valuable fruits, roots, and greens, is produced: though there are a few of the pulses common in the Carnatic that do not appear to be much known; such as, *Carp Ulandoo,* and *Malay Towary.*

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(1) The revenue annually received from rice, or Nunjeh cultivation, in the Tinnivelly province, is 285,000 star-pagodas. That from dry grain, or Punjeh cultivation, is 95,000 star-pagodas;—making a difference, in favour of rice cultivation, of 190,000 star-pagodas.

Section II.

The Climate that has been experienced in these Provinces since November 1808, up to the present Period, contrasted with that above mentioned—Its Effects on the Cultivation of the Soil.

We shall now proceed to say something of the climate that has prevailed in the districts in which the fever has raged for three years past; and, on comparing it with that of common years, we shall find, in the result, that irregularity of season, and that unnatural state of the atmosphere at certain periods, which we conceive to have been the general cause of all those ills which have occurred.

The years 1804, 1805, and 1807, were remarkable over the Coimbatore, Dindigul, Madura, and Tinnivelly districts, for their dryness; but they were very healthy. In 1808, much more rain fell in the three first-mentioned districts than there had

done for several seasons before: but in the Tinnivelly province, the monsoon of that year was unusually heavy, and was succeeded by a more than common cold wind, in January and February 1809.

The monsoon of 1809 was of more than usual severity; but less so in Tinnivelly than in the northern tracts of our prescribed range. It began very early, and at first mildly, in the Coimbatore, Dindigul, and Madura districts; that is to say, little rain fell in those countries early in November: but when the month was farther advanced, and in December, the fall of several days was heavy and incessant; and the Cavery and Vyaar rivers rose toa prodigious height, particularly the first, which overflowed its banks to a greater extent than it had ever been known to do.

January and February, 1810, in Madura and Dindigul, were pleasant months; and the air, during the former, cold and bracing: but in Tinnivelly it proved neither. In the

northern districts of our range, there were occasional showers about the end of March, in April, and in the beginning of May, with their usual attendants at this season—clouds of dust, thunder, and whirlwinds; but the southerly winds were much weaker than usual, and must on that account have but *partially ventilated* many tracts situated amongst the hills, as well as others which border on them. No rain fell in Tinnivelly till late in May, when the s.w. monsoon burst over the western ghauts, but not with more than common violence. The west wind in 1810 was observed in the northern districts, as well as in Tinnivelly, not only to be less strong than usual, but, in place of continuing to blow till the end of August or middle of September, it lulled early in July. Heavy rain fell in August and September. October and November were excessively close and sultry. Late in the latter month, the N.E. monsoon commenced in the Dindigul and Madura countries, and poured over them absolute floods, bursting their banks, laying all the low

lands under water. Torrents rushed down the sides of the mountains in the first-mentioned district with such violence, that several hamlets were swept away in the Toddy Comboo division. The Vyaar river at Madura was impassable, even by elephants, for many days, and flooded the country, east of that capital, for miles.

" The great tank at Ramnad, in which " this river terminates its course, and usu-" ally is not filled for seven years together, " burst its banks, and ran into the sea: " reservoirs of water, that had been under " dry cultivation or pasture fields, have, " since these unusual rains, contained more " or less water; and the ditch surrounding " the Fort of Madura particularly, which for " years had been dry, has been constantly " kept full of water. The level of the water " in the wells within the Fort, which in 1806 " had been twenty feet from the surface, has " risen at times within three feet of it[1]."

(1) See the Paper of the 3d Number of this Committee, which has lately been laid before Government by the Medical Board of Madras.

In the Tinnivelly district, the rainy influence of the N.E. monsoon, which we have observed, in common years, is not so considerable as in those situations lying farther north, was this season severely felt. At first the rains were trifling in quantity; but on the 5th of December they commenced, falling in torrents; and continued so to do till the evening of the 8th, when the Sytar and Tambarapournie came down in vast and sweeping floods, destroying several villages[2], causing the loss of many lives, carrying away hundreds of sheep and cattle, overflowing the country for miles, and rendering insular the habitations of most of the Europeans belonging to the stations of Palamcotah and Tinnivelly.

The same rains brought a great accession[3] of water into the salt marshes, which

(2) And a still greater number of detached huts, particularly those of the toddy men, in the neighbourhood of Caulcaud.

(3) To such an extent did the water then rise in some parts, that it reached half way up the palmyra-trees.

was kept up by the subsequent torrents falling out of season, in February, March, and April; the consequence was, that, in place of the vapours from these swamps being quickly exhaled by the dry weather which usually ensues after the monsoon, they continued for a period of nearly four months, and to a season of the year when they could not fail of proving most injurious, by being converted, through the superagency of a close and sultry heat, from a simple saline exhalation, into putrid salt-marsh miasmata;—the fatal effects of which have been but too severely felt, as may be seen by referring to the account of deaths in the talook of Punjmahal, in the third section of this Report.

The inundation in December 1810 did not produce, as might have been expected, that cool state of the atmosphere which commonly follows the N. E. monsoon rains: a singularity which was not confined to Tinnivelly, but also distinguished this season in Madura, Dindigul, and Coimbatore; in

which provinces the months of January and February were remarkable for a very faint north wind, and a hot and clear sunshine. February, March, and April, which in proper seasons are proverbially dry on the Coromandel coast, this year exhibited, all over the southern territories, a rare, unnatural, and extraordinary variation, by heavy rains[1], accompanied by the still more uncommon phænomena of an occasional N.E. wind, and much thunder and lightning.

In speaking of the climate of these provinces in regular seasons, we observed, that during the months of March, April, and part of May, strong ventilating and warm winds prevail: but such was not the case in 1811; on the contrary, the southerly

(1) These rains, truly called unseasonable, began early in February, and continued more or less for the greater part of it: about the beginning of March they fell very heavily for days together, and were frequent during the rest of the month. In April there was much rain, and the sun was generally obscured by clouds: May was drier, though by no means so much so as in common seasons.

wind was languid and wavering; the most oppressive lulls were frequent, quickly alternating with sudden gusts of bleak air, and accompanied with heavy showers from the N. and N. E. But if this feeble state of the southerly wind was so conspicuous in the open country, what must it have been in situations near to or altogether amongst the mountains, where, at this season, a dry ventilation is essentially necessary! What was peculiarly observable in the state of the atmosphere at this time, the period too at which the epidemic raged with the greatest violence[1], was a certain denseness in it, sometimes almost creating a difficulty of breathing,—a feeling we had occasion to experience about the middle of April at Dindigul: and we learn, from Mr. Hepburn, that at Tinnivelly it was equally remarkable, and as distressing. There was besides, during these months, a singularly oppressive, hot, and steamy vapour, which

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(1) From every account we have received, it appears that the most unhealthy period, in all the four districts, was from towards the end of February to the beginning of May 1811.

rose from the ground, and which gave a sensation not unlike what is occasionally experienced from a crowded assemblage of people in hot weather: added to all this, the dews, which in common seasons are pretty well over by the middle of March, continued to fall heavily so late as the 19th and 20th of May, and could not fail, by chilling the body after the relaxation of a hot night, to prove productive of infinite mischief.

The west wind did not begin to blow so early as usual this season, and was by no means so strong as it commonly is, through the whole extent of the four districts: after having commenced, it ceased again for several days towards the end of May, giving place to gentle airs from the E. and S. E. In June, and early in July, it was everywhere observed not to be so powerful as usual; and in the Streevulputtoor talook, of the Tinnivelly district, there were great complaints of its inefficacy; though it has since blown with greater force; and *now* (the end

of August) the climate not only appears to be nearly what it ought to be, with regard to winds[1], but to have in a great measure gratified the hopes and expectations of thousands, by changing the constitution of the atmosphere, and almost entirely banishing the epidemic fever.

From the account which we have given of the climate of Coimbatore, Dindigul, Madura, and Tinnivelly, for the last three years, it will readily be allowed, that the different seasons, during that period, have varied much from their usual course; inordinate rains have succeeded to uncommon drought; the N. E. wind and Land-wind have been weak, as well as of unusual duration; the most distressing lulls have

(1) From a due degree of strength in the drying and purifying west wind, we ever conceived that much benefit was to be looked for. In the Carnatic, where such winds are always dry, epidemic fevers are absolutely not known;—a fact noticed by Dr. Lind, many years ago. Zimmerman, in his "*Experience*," dwells much on the advantages often derived from strong winds, by purifying the air from noxious vapours.—See *Zimmerman's Experience*, vol. II. p. 15. English Translation.

alternated with sudden and chill blasts from various directions;—and, last of all, and what appears to have brought the mischief to a crisis, heavy rains and close sultry weather have been seen to take place at those times which are usually distinguished by dryness, and those ventilating breezes, which exhale the superfluous waters from low and marshy situations, and dispel the dews and vapours which are sure to prevail after the ceasing of the N. E. monsoon. Thus there has been constituted an extraordinary and unnatural state of the atmosphere, everywhere unsalutary, in the tracts in which it was produced, or into which distempered miasmata may have been carried by particular currents of air.

The stagnation, vegetable putrefaction, dampness, filth, and offensive effluvia, the natural consequences of what we have just stated, have proved evils of no small consideration, particularly in low or ill-ventilated situations.

The second Member of this Committee, in travelling from Daraporam to Dindigul in the beginning of June, and on passing along the banks of several marshy tanks, as well on the western frontier of the first-mentioned district as in the Toddy-Comboo talook of the second, was assailed by a noxious and sickening exhalation, which somewhat resembled bilge-water: and the President and third Member experienced exactly the same effect, from similar causes, towards the end of the same month, in passing from Towerincourchie to Cottampetty in the Madura province; and again, for several miles, on the road leading through, and on the north side of, the large and beautiful town of Streevulputtoor in the Tinnivelly country.

It can be easily supposed that a continuance of unseasonable weather, for several years together, must, with other bad consequences, have proved injurious to the cultivation of the soil. In Coimbatore,

however, which is chiefly a dry grain country, in which superfluous water is quickly carried off into rivers and *nullahs*, this has not been conspicuous; and, by Mr. Garrow's returns, it does not appear that any particular sickness has prevailed amongst the cattle of that district, of which he is the Collector.

With regard to the Dindigul country, we had occasion, while there, to observe, in the month of April last, that so general was the sickness, and so great had been the mortality, that the *sumbăh* crop of Paddy was actually, in some places, rotting on the ground, from want of hands to cut it down: and Mr. Peter (Collector of the Madura and Dindigul districts) informs us, that many thousands of cattle have died in the different divisions under his management, since the epidemic first commenced; as much, we are inclined to think, in consequence of the unnatural state of the air, as from a scarcity of hands to feed and take care of them.

In Tinnivelly we understand, from Mr. Hepburn, that not fewer than 44,273 bullocks have died since the beginning of February last; not so much from any particular disease, as from an excess of moisture in the air, and a want of people to take care of them. Mr. Hepburn has further informed us, that the great *péshanum* or *sumbăh* crop, which is gathered in February and March, was got up in a much less perfect condition than usual, from its being so frequently wetted, and from the inhabitants being under the necessity of cutting it down before it was quite ripe; owing to the dread they entertained, that if they allowed it to stand longer, they would lose great part of it, from the violence of the rains. Such stunted and immature grain, when stacked, was apt partially to ferment and get heated, which rendered it a much less wholesome food than if it had been cured in a better state: and he further informs us, that so general has this calamity proved in the Tinnivelly district, that the greatest diffi-

culty has been experienced in procuring the small quantity of sound grain required for seed for the cultivation of the present year. The dry grains, from the same cause, have also suffered much, and must, in consequence, have been rendered less nutritious.

Having deemed it proper, at this part of our Report, to notice the circumstance of the crops of these countries having suffered much from unseasonable rains, and that the quality of the edible products had been thereby injured, we must here observe, that though the necessity thus induced, of eating somewhat less wholesome grain than usual, cannot be considered otherwise than as a great misfortune, yet we conceive that it must not be included amongst the causes of the epidemic fever, which had commenced at a period antecedent to the failure of the harvest: it certainly, however, may, by inducing debility, have contributed much to render the disease more frequently fatal.

Section III.

Rise and Progress of the Epidemic in the different Districts —Numbers who have died of the Disease within certain Periods, compared, in some instances, with those in common Years—At what time the Fever appears to have raged with the greatest violence.

When it is considered, that one great cause has prevailed in producing a distempered state of the atmosphere in the Southern Provinces of the Indian Peninsula, we are much inclined to think, that although, in some of these countries, the effect may at first have been but trifling, and therefore little noticed, they must all have suffered, in a greater or less degree, nearly about the same time; with this difference, that such tracts as, from their situation or peculiar nature, were most fitted for nourishing or increasing the operation of the evil, would of course feel its influence to a more alarming extent. After several years of unusual drought, we have observed, that

heavy monsoons and irregularity of climate became conspicuous in 1808, and have continued to be so up to the present period; and it is from the commencement of this deviation from natural order that we can trace the earliest approaches of that sickness which has since proved so fatal.

The first public notice we have of the epidemic fever, except Dr. Christy's official communication to the Superintending Surgeon of the Southern Division, in 1808, is that of Mr. Garrow, in a communication to the Revenue Board, of date the 25th of October 1809; about which time, he speaks of its having raged severely in his Collectorate, in the Chukragherry talook, at places called Columbam, Cullaporam, and Comoralingum, and which, he adds, are close to the hills, marshy, and proverbially unhealthy: it soon after extended to many other villages in a northerly direction; thence eastward, to others in the vicinity of Daraporam; and in October last, it made its way still further towards the north. But, by Mr. Garrow's account, it

received a check in January 1811; not, however, before it had committed great havoc, especially from the month of January 1810, to June of the same year; during which period 8924 persons died of it, in the Coimbatore Division only.

The favourable hopes that were entertained, at the beginning of the year 1811, we are sorry to say, were but too soon blasted; for, after the untimely rains in February, the disease recommenced its work of destruction with great severity; and spread not only amongst those villages the most liable, from their low situation, to be visited by such maladies, but to others lying much farther east, high, dry, and, in common seasons, healthy.

Mr. Garrow has informed the Committee, that the almost universal opinion in Coimbatore is, that the epidemic fever first entered that district from the direction of the Pylney Mountains; and, according to his own observation of the malady, its course has been from south to north, inclining

towards the east,—and from the hills, near to which it first shewed itself, after the most unseasonable of all the irregular weather we have mentioned; we mean that occasioned by the falling of heavy rains in February, March, and April.

Although the statement we have of deaths, from the Collector of the Dindigul district, does not extend farther back than to the 1st of April 1810, yet we are well aware that the epidemic had been prevalent there before that time; nay, by information we received on the spot, we know that many had sunk under it at a period antecedent to that above mentioned, especially in the sequestered zemindaries of Neelocotah and Sundypoor, and in the Toddy-Comboo division.

There is in this province, also, a general belief that the Pylney mountains gave birth to the evil. It certainly evinced the same peculiarity here that we observed in Coimbatore; viz. that it was felt in situations

near the hills; and afterwards, as the general cause extended its baneful influence, spread to tracts naturally drier and more healthy.

We see, by Dr. Christy's Paper, that a fever had prevailed, in certain parts of the Madura district, as early as 1809; and, more or less, in the Fort itself, about the same period. It would seem, at that time, however, to have been chiefly confined to the poor, who occupied the lowest huts; and seldom attacked the better sort of people, who lived in elevated houses of brick or stone, and slept on couches; nor was any European that year affected by it.

In 1810, the disease became more general and alarming than in the former season, as well in the city of Madura, as at other places of the province. It now neither spared Europeans nor the more wealthy natives, and proved fatal in many instances: but, as in the other territories we have mentioned, the months of February, March,

and April, 1811, appear to have been by far the most calamitous era; no doubt from the causes already assigned.

In this district, like the others within our range, the Pylney mountains are considered by the natives as the great cause of all their misfortunes. But here we find an extension of the epidemic, not, as in Coimbatore, from south to north, but from north to south. Here it has also been invariably remarked, that it was in low situations, close to the hills, such as at Towerincourchie and Sholavandum, that the fever first attracted notice, and that the rains and close weather, in February, March, and April, had the unhappy effect of diffusing the morbific miasmata over tracts farther east than they had before reached, and comparatively high and dry. Divisions, however, nearer to the sea, or, rather, farther from the range of mountains in this Collectorate, such as those of Shevagunga and Ramnad[1],

(1) Kilkerry, and its neighbourhood, must here be excepted; where, from the vicinity of a salt marsh, the fever has been prevalent for some months past.

have, in a great measure, escaped the disease altogether; as was witnessed by the second and third Members of this Committee, during an excursion they lately made through the zemindary.

The Collectorate of Tinnivelly seemed, for a time, as if kind Providence had averted from it the mischief which was destroying so many thousands in countries lying but a short distance from it; but it soon appeared that the evil was only retarded. It is true, that in the months of March, April, and May, 1810, as we are informed by Mr. Hepburn, fever had attracted notice in the northern and western parts of the district: it was however trifling, and but of short duration; and no more was heard of it till the month of February[1] 1811, when it shewed itself very generally in the talook

(1) It was at this period that many pilgrims returned from a feast at Pylney, where the fever then was, and had been for many months. These pilgrims had left their own villages about the end of January 1811, at which time there was no fever in them. Shortly after they had returned to their homes, however, they were almost to a man attacked with fever; and, we are sorry to add, scarcely one of them is now living.

of Streevulputtoor (which is contiguous to the Madura province), and in Tencoushie, both of which lie near the mountains. Soon after this, it broke out in the vicinity of the sea and salt marshes, and committed great ravages in the Punjmahal[2] and Calcaud[3] talooks: and, lastly, it extended itself from Tencoushie to the more southern tracts, including the Pollams, and kept on its course all the way to the sea, but invariably proving most destructive in those villages situated nearest to the hills.

From the above account, there will be observed this singularity, that, in the neighbourhood of the salt marshes, the disease made its appearance at a period prior to that at which it first began in places lying betwixt them and Tencoushie;—a circumstance which leads us to conclude, that, in these briny swamps of the Tinnivelly

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(2) This talook stretches from Shengulotum to the southern extremity of the Peninsula.

(3) This stretches from Trichindore to Manapore, along the sea-side. Twelve villages in it have suffered dreadfully.

district, a separate source of the disease is to be looked for, from that which occasioned the sufferings of those inhabiting the more northern divisions of the same province.

The malady, on its way south from Tencoushie, would appear to have got first into the Bramadashum[1] talook, in an alarming degree, about the beginning of March, especially in the village of Veeramasingaporum, near the Pápánásum Cataract; in which so great a mortality soon ensued, that it was with difficulty sufficient hands could be procured to burn the dead. In Sheermadévy, the epidemic was felt somewhat later—not before the beginning of April; and then, though numbers died of it, it neither was, nor has since been, so severe as in some other divisions; owing perhaps to its having the Polygar countries betwixt it and the western mountains.

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(1) Most of the villages in Bramadashum lie near the hills, and are surrounded by much low and marshy ground.

In Nelleumbalum, in which talook the city of Tinnivelly stands, the disease (if the city itself is excepted) did not commence so early as in situations nearer to the hills. In the month of April, however, it appears to have been very prevalent; as most of the inhabitants were then sick, and many died, particularly in the town of Caddium. In the talooks of Vedoogramum, Stryvygoontum, Gãingoondum, and Alivar Tinnivelly, the disease has been much less destructive than in the other parts of the province, although in them there has also been more sickness than in common years; and this peculiarity in their favour we can only account for from their lying at a considerable distance from the great Ghauts, and from their standing higher above the level of the sea: to which causes also is in a great measure to be ascribed the comparative healthiness of Shenkernacoil, which extends to the hills only at one corner, being at other points separated from them by the pollams of Shevagherry and Chokumpetty.

From what we have said of the rise and progress of the malady in the province of Tinnivelly, it will be concluded that the general direction of the morbific influence has been here opposite to what it was in Coimbatore, which was from south to north, and a little east; and that it corresponds with that which it took in the Madura district, which was from north to south. We have moreover observed, that, the closer to the hills, the more certain was the danger; and that in some tracts in the vicinity of the salt marshes, along the sea-side, there appears to have been altogether a separate spring of epidemic influence.

With regard to the two opposite directions in which the distempered exhalations seem to have extended themselves in different parts of the Peninsula, and the cause or causes of these varying courses, we confess that we give our sentiments with great hesitation; as the subject not only involves in itself considerable difficulty, but naturally leads to some yet undecided points,

and to the theories and opinions of certain ingenious men, respecting the propagation and diffusion of miasmata and contagion.

We have repeatedly noticed, that great irregularity of seasons had taken place, throughout the whole of the southern provinces; and it is certainly allowable from a universal cause to look for a general result: but while the same description of unusual climate may have prevailed in all these territories, yet the lands themselves may have had localities or peculiarities, of such a nature, as, although under a common influence, to have proved productive of effects differing much in degree. Thus it is that a long-continued unnatural state of the air, operating upon the close and overgrown woods of the Pylney mountains, upon their unventilated valleys and stagnant marshes, could not fail to engender a more rapid and dangerous condition of the atmosphere than that brought about by the operation of the same causes on the drier and less woody plains of the eastern ranges

of the Peninsula. In the same manner, and for the same reason, the changed constitution of the atmosphere has been creative of ill effects in the vicinity of the salt marshes of the Tinnivelly country, differing much in degree from those experienced in other estates, which, though at no great distance from them, are otherwise circumstanced with respect to nature and situation.

The fever, which has occasioned so great a mortality on the Coromandel coast, was first purely endemic; and, in all probability, had the irregularity of seasons been of short duration, it would not have been much heard of beyond the sources from which it sprang: although we find, and that from high authority[1], that even the causes of endemic fever are sometimes carried, by particular currents of air, to a considerable distance: but on the disease

(1) See Dr. *Jackson's Remarks on the Constitution of the Medical Department of the British Army*, p. 212. See also *Zimmerman's "Experience,"* vol. II. p. 155. English Translation.

having been rendered epidemic, by the same means[2] which bring about this change in every quarter of the world, its nature, as usual, became in some respects altered. "Fevers of this sort" (says Dr. Jackson) "arise in particular countries, or districts "of a country. They travel in certain tracts: "sometimes confined to narrow bounds; at "other times they are more widely dif-"fused."

We have seen this epidemic of India spreading its poisonous breath from south to north, and a little east, in the Coimbatore province; as much, perhaps, owing to the extension of moisture, combined with heat, as it may have been assisted in its course from what the natives suppose to be the grand endemic source (the Pylney mountains), by the s.w. winds in the months

(2) Hoffman tells us, that intermittent fevers are most common in autumn and spring, and that they are endemic in low marshy situations; but that, when rainy, variable seasons succeed hot summers, they frequently become *epidemic*.—Vide *Med. Rat. Syst.* pars I. cap. 1.

of March, April, and May. In the Dindigul territory, this mischief, if carried by the winds, had not far to travel from the same unwholesome spring: independent of which, however, the Dindigul district had, in itself, other localities, extremely likely, from their nature, to have generated endemic fever; such as the low Toddy-Comboo division, the valley, and that singular mountainous amphitheatre which surrounds Towerincourchie and its marshy neighbourhood.

The garrison of Madura, and other places situated nearer to the hills, in this district, became absolute hot-beds for fever, in the seasons we have had occasion to lament; and must, if the notion be just, that the morbific miasmata can be conveyed from place to place by particular currents of air, have been of extent sufficient to have affected the whole province.

Tinnivelly, we have seen, did not suffer much before the heavy rains in 1811; and,

at that time, there are two ways in which we may suppose the evil to have been produced; viz. either as originating and spreading, from endemic sources, within the district itself, or as it may have been conveyed thither by the N. E. monsoon winds, which continue to prevail in the month of February; and perhaps both of these may have had their share in bringing about the general calamity[1]; though, we confess, we are inclined to think, that if the extension of the disease was as much occasioned by miasmata being carried by the breeze, as it is dependent on a peculiar and general state of the air in certain places, we should occasionally see it spread itself wide of those tracts it has been universally observed

(1) However singular the coincidence of the pilgrims having brought the epidemic fever with them on their return to Tinnivelly from Pylney in February 1811, we cannot allow (at all events, we deem it not probable) that the malady was in any degree propagated in this district by means of contagion: and Dr. Jackson has told us, that no medical fact is better established, than that diseases of this nature are not contagious.

chiefly to prevail in; and which are ever found to be those nearest to, and in the direction of, the great endemic sources.

We regret that the account of deaths which we have received from the different Collectors are not all for equal periods, nor made out according to one prescribed form;—circumstances which will prevent us from rendering such exact comparative statements as we otherwise might have done. We trust, however, that they will not be unsatisfactory, as they will shew the varied extent of the mischief in the different districts.

The return of deaths transmitted to us by Mr. Garrow, for the Coimbatore Collectorate, is for sixteen months; that is, from the 1st of January 1810, to the 30th of April 1811; during which time there died in the different talooks (12 in number) 12,458 males, and 9,993 females; making a total of 22,451. The population of the Collectorate, in Fusili 1219, amounted to

596,606; so that, on the whole population, we may reckon that, in the sixteen months, there have died about $3\frac{3}{4}$ per cent.

To shew the centage of deaths in the different talooks of this province, compared with their varying population, we have constructed the following Table; by which it will appear, that in the Pillauchie and Satimungulum divisions, both contiguous to the mountains, the fever has been the most destructive; the first having lost, during the period above mentioned, $6\frac{15}{16}$ per cent. of its whole inhabitants; the other, $5\frac{1}{16}$ per cent.

Talooks.	*Population.*	*Deaths.*	*Per Centage.*
Coimbatore	83,882	3,588	$4\frac{1}{4}$
Checoor and Coorumundoor .	50,413	1,896	$3\frac{3}{4}$
Parindoril	53,193	1,503	$2\frac{13}{16}$
Erroad	32,326	861	$2\frac{5}{8}$
Andoor	44,306	1,955	$4\frac{3}{8}$
Satimungulum	50,326	2,567	$5\frac{1}{16}$
Colingall	44,426	1,712	$3\frac{13}{16}$
Caroor	54,015	1,691	$3\frac{1}{8}$
Daraporam	59,047	1,461	$2\frac{7}{16}$
Pillauchie	41,438	2,878	$6\frac{15}{16}$
Chukragherry	44,478	1,260	$2\frac{13}{16}$
Pulladum	38,756	1,109	$2\frac{13}{16}$
Total	596,606	22,451	$3\frac{3}{4}$

The statement which we have received from Mr. Peter, the Collector of the Dindigul district, shews the number of people who have died in it during a period of twelve months; that is, from the 1st of April 1810, to the 31st of March 1811, contrasted with the deaths in common years.

In the four divisions of Toddy Comboo, Syempilly, Thenkerry, and Wootampolam, and in the minor and sequestered zemindaries, there have died, of males and females together, within the twelve months, 21,510. In healthy years, the mortality is said to be annually about 3,438, which makes a difference of 18,072. The population of the divisions and zemindaries, in Fusili 1212, amounted to 295,654; so that, in the twelve unhealthy months, there has died about $7\frac{1}{4}$ per cent. of the whole inhabitants.

The different divisions in this district have suffered in the following proportions:

Where 100 men would have died, in common years, in the sequestered zemindaries, there have died, within the period above stated		832
Ditto,	Ditto, in the minor zemindaries	733
Ditto,	Ditto, in the Wootampolam division	675
Ditto,	Ditto, in Toddy Comboo	591
Ditto,	Ditto, in Thenkerry	513
Ditto,	Ditto, in Syempilly	484

So we find that the sequestered zemindaries have been the most unhealthy, and the division of Syempilly the least so.

The statement which we have received from Mr. Peter, Collector of the Madura district, is also for twelve months, up to May 1810; by which it appears, that in the seven talooks of Maudakolum, Sholavandum, Teramungalum, Aungoor, Thooramboor, Mellal, and Nuttum, there have died, males and females together, 24,626. In a healthy season, the number of deaths is said to be about 3,933 annually, which makes the great difference of 20,693. The population of the province (in Fusili 1212) amounted to 245,654; so that, in the sickly months, there died about the proportion

of 10 per cent. of the whole inhabitants. The divisions of the Madura district have suffered in the following proportions:

Where 100 men would have died, in common years, in the talook of Mellal, there have died, in the twelve sickly months				1147
Ditto,	Ditto, in the talook of		Maudakolum	$821\frac{5}{8}$
Ditto,	Ditto,	Ditto,	Sholavandum	$762\frac{3}{8}$
Ditto,	Ditto,	Ditto,	Aungoor	601
Ditto,	Ditto,	Ditto,	Teramungalum	592
Ditto,	Ditto,	Ditto,	Thooramboor	507
Ditto,	Ditto,	Ditto,	Nuttum	$486\frac{5}{16}$

By the statement delivered to the Committee by Mr. Hepburn, Collector of the Tinnivelly district, it appears that, in the eleven divisions of Shermadévy, Streevulputtoor, Shenkernacoil, Stryvygoontum, Caulcaud, Alvar Tinnivelly, and Punjmahal, together with twenty-seven *pollums*, there died within five months, from the beginning of February to the 30th of June, 1811, of males and females together, 38,202. The population (as it appeared in Fusili 1211) amounted to 690,696; which gives a centage of deaths, in that period, of about $5\frac{1}{2}$.

The following is the centage proportion of deaths in each particular division, calculated according to the respective population:

Tencoushie	12 per cent.
Streevulputtoor . .	6½
Bramadashum . . .	6½
Punjmahal	5¾
Calcaud	5¾
Nelliambalum . . .	4½
Shermadévy	4¼
Vedoogramum . . .	4
Shenkernacoil	3½
Stryvygoontum	3½
Alivar Tinnivelly	2¾

It would therefore appear, upon the whole, that, in the district of Tinnivelly, the epidemic fever has raged with the greatest violence; since, in the short period of five months, 5½ per cent. of the population have fallen a sacrifice to the disease. But, to render our account more satisfactory, we shall add a Table, shewing in some measure the comparative calamity that has befallen the respective provinces.

TABLE

Affording a Comparative View of the POPULATION, *and* DEATHS, *in the Four following Provinces.*

	Population.	*Deaths.*	*Centage on Deaths.*
Coimbatore, for 16 months . .	596,606	22,451	$3\frac{3}{4}$
Madura, for 12 months	245,654	24,626	10
Dindigul, for 12 months . . .	295,654	21,510	$7\frac{1}{4}$
Tinnivelly, for 5 months . . .	690,696	38,202	$5\frac{1}{2}$
Total . . .	1,828,610	106,789	$5\frac{13}{16}$

Section IV.

Causes of the Epidemic, with Suggestions respecting the Circumstances that may have rendered it peculiarly fatal, in particular Situations, and to certain Descriptions of People.

Celsus[1], one of the most accurate observers amongst the writers of antiquity, has said, that those seasons are ever the most salutary which are the most uniform, whether hot or cold; and that those which vary much are the sickliest;—principles, we believe, which have never been disputed, and which are powerfully illustrated in the instance of the evils which we have been at this time called to investigate. And in the 3d Section of this Paper, we have noticed, that so highly were the same sentiments appreciated by Hoffman, that he deduced from them his general remote cause of epidemic fever.

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(1) Vide *Cels.* lib. II. cap. 1.

The actual state of the atmosphere, which engenders this malady, no one[1] has been able hitherto to detect, though much ingenuity has been displayed on the subject: and we may with safety say, that when Sydenham[2] ascribed such derangements to a "secret constitution of the air," he gave us as satisfactory an account of the matter as any more modern author has since done. But, although we cannot positively determine what this secret constitution is, we can pretty nearly ascertain under what circumstances it arises.

Dr. Cullen has used the words "marsh miasmata," to express what he conceives to be the remote cause of remitting and intermitting fever: and although the chemical nature of the distempered exhalations has not yet been exactly ascertained, owing perhaps to the poison being so intimately

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(1) See *Dr. Jackson's Treatise on the Fevers of Jamaica,* page 78.

(2) See *Swan's Sydenham,* pp. 7, 8.

mixed and blended with the air, he expresses a firm belief in the truth of his assumption, from the circumstance of maladies of the nature in question so constantly prevailing in low and swampy situations. Many such we have taken notice of, in the First and Third Sections of this Report. This opinion, however, of the cause of fevers of the intermittent kind, has been perhaps too implicitly adopted by some modern writers; who seem to think, that a state of the atmosphere, capable of generating this disorder, can only take place in marshy countries; though it is well known that noxious vapours from woods, especially if thick and ill ventilated, are as certainly a source of the same mischief;—a fact which has been mentioned by Dr. Donald Munro[3], but more particularly by Dr. S. Farr, in his ingenious Preliminary Discourse to his translation of Hippocrates' History of Epidemics. There he tells us, that wild woods, in uncultivated countries,

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(3) See *Dr. D. Munro's Observations on the Diseases of the Army.*

have been observed to give birth to that peculiar condition of the air, which may be the cause of epidemic diseases. Admitting then, which we most readily do, this second source of the malady, we shall not be obliged to look far for it in the southern districts; as not only are all the mountains and intervening vales, which form the western boundary of these countries, covered with wood, so overgrown as to be in many places almost impervious; but there are, in the Dindigul and Madura provinces, many other detached hills and valleys between, thickly clothed with jungle, and much rank vegetation—to say nothing of the extensive tracts of underwood, so frequently to be met with.

There is still a third origin of morbific miasmata to be found in the Tinnivelly and Ramnad districts; that is, the salt marshes; in the neighbourhood of which we have seen, that, in the months of February, March, and April last, the fever raged with more than common severity.

Sir John Pringle[1] has told us, that there is a peculiar kind of damp which rises at low water from a beach covered with slime, —the more liable to corruption, on account of the mixture of salt and fresh water. Dr. Jackson[2] has, however, disputed the correctness of this opinion. He says, indeed, that it would be in vain to deny that the vicinity of lakes in which there is a mixture of salt water is often unhealthy: yet he affirms, with confidence, that it is seldom more so than when the lakes are altogether without this admixture. Which of these opinions seems most correct, we shall not venture to say.

In parts adjacent both to the briny swamps near Kilkerry, in the Ramnad country, and in those in the Punjmahal talook of the Tinnivelly district, the epidemic fever was particularly destructive; but whether this may have been owing simply to the exhaling influence of the sun upon extensive marshes

(1) See *Pringle's Observations on the Diseases of the Army*, p. 3.

(2) See *Jackson's Treatise on the Fevers of Jamaica*, pp. 81, 82.

flooded to a very considerable degree, or in any measure consequent of the salt water they contained, we cannot determine.

We have now seen that three great remote causes have been assigned for remittent and intermittent fever; all of which, we conceive, have contributed to produce the calamity which has proved so fatal in this province. But marshy situations do not appear of themselves to be sufficient to render such affections epidemic: to produce this effect, there is required the superagency of a close, moist, and sultry heat[1], and imperfect[2] ventilation. Hence it is, that in common years there is not produced, in many of the low situations we have particularized, a miasma of sufficient malignity to excite the general disease; because, in such cases, the exhalation of superfluous moisture takes place during the cold months of December and January, when they are

(1) See *Dr. John Clarke on the Diseases of Long Voyages*, vol. I. p. 157.

(2) See *Pringle's Diseases of the Army*, pp. 3, 4.

comparatively innocent: but rains falling out of season, and in great abundance, at periods when the weather had become hot, and when there was so distressing and unnatural a deficiency of free ventilation in the atmosphere, occasioned evaporations of a very different nature; and which, we conceive, became a positive source of mischief, by bringing on that corrupt and stagnant state of the air which is ever closely connected with the decay or decomposition of vegetable matter. Such an offensive condition of the atmosphere, we have remarked in our Third Section, was but too often experienced in several of the low tracts of these districts, during the sickly season. It was pregnant with most baneful consequences; and strongly recalled to our recollection the following paragraph of a well-written Paper, which may be found in the *Medical Repository*[3]: — "The cool "refreshing northerly breezes were now "changed for oppressive calms, or for

(3) See vol. I. of the 2d *Hexade*, p. 145.

" humid or sultry winds. Such are the " changes which the state and temperature " of the atmosphere undergo in the islands " of the West Indies, and elsewhere, pre- " vious to the breaking out of some *mortal* " *epidemic!*"

Great deviations[1] from the natural order of climate, we are happy to think, do not very frequently occur in these regions: as in other tropical countries, the seasons are pretty regular and steady; and strong winds, blowing from fixed points, keep the atmosphere in an almost perpetual state of agitation, and of consequent purity[2]. We have seen, however, in the melancholy instance before us, that the very reverse of all this has lately happened; and, as has been judiciously noticed by Mr. Hepburn, in a com-

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(1) The natives themselves also ascribe epidemic distempers to these unusual deviations from natural climate; as we learn from the *Ganétamnötum*—an astronomical Sastrum, to be found in the library of the Sheva Pagoda, at Tencoushie, in Tinnivelly.

(2) See *Zimmerman's "Experience,"* vol. II. p.145. English Translation.

munication he made to the Medical Committee, we perceive that a nearly similar departure from the common course of seasons took place in the Tinnivelly province in the year 1757, as is mentioned by Mr. Orme, in his "History of Hindoostan[3];" and that it was followed by a like calamity. He tells us, that, in the month of March, the south-west monsoon was so violent, as to break completely over the Western Ghauts, and descend in vast floods into the Coromandel side of the Peninsula, where the rains fell, without intermission, for two days,—destroying crops just ready to be cut,—sweeping away many of the inhabitants,—and ultimately, by creating a powerful evaporation during a sultry heat, producing an epidemic disease very fatal in its consequences.

With regard to the effects of the miasmata generated amongst woods and jungles, besides the testimonies already adduced, we

(3) See his *History*, vol. II. p. 201.

beg leave to call the attention of the Board to what has been noticed by a very able writer[1] on the diseases of the West Indies; who says, that in the uncultivated tracts of those countries, where there is much rank vegetation—where the narrow valleys between the mountains, replete with moisture, are often not sufficiently ventilated—there are produced exhalations, at any season bad, but particularly so after autumnal rains and sultry heats. He moreover adds, that mighty torrents, by washing dead matter, animal as well as vegetable, into low swampy lands, where it is left to putrify, not unfrequently prove the indirect cause of the most pernicious effluvia. And Zimmerman[2], who paid much attention to the effects of air upon the human frame, is of opinion, that in woody countries much mischief may not only arise from a deficiency of ventilation, but from the noxious qualities of the trees

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(1) See *Dr. Fowle's Practical Treatise on the different Fevers of the West Indies,* pp. xvii.—xxi. of the Introduction.

(2) See *Zimmerman's "Experience,"* vol. II. pp. 140, 141. English Translation.

themselves; in support of which he mentions the bad effects well known to be produced by the poisonous exhalation of the Hippomanes of Surinam.

Dr. Trotter, in his Medicina Nautica[3], adopting in a great measure the opinions of Priestley, informs us, that growing vegetables are found, by experience, to purify the air: they add oxygen to it by decomposing the water of the atmosphere, and the hydrogen goes to the nourishment of the plant: but this process, he adds, only takes place when there is the light and heat of the sun to assist in the operation. If this notion be just (and the consequences incline us strongly to repose on it), how many thousand plants and shrubs must there be in thick woods and jungles, that, by growing totally in the shade, cannot be supposed to purify the air! On the contrary, they may, by harbouring moisture and obstructing ventilation, prove productive of the most unsalutary vapours; requiring, perhaps, little

(3) See *Trotter's Medicina*, vol. III. p. 273.

else than the concomitants of decayed vegetable matter, and a close and steamy heat, to induce that distempered state of the atmosphere which we suppose to be the remote cause of the malady in question;—a cause too, which, there is but too much reason to believe, was most amply supplied amongst the overgrown, shady, dank, and ill-ventilated woods, valleys, and mountains of the Dindigul, Pylney[1], and Madura countries, as well as amongst those of that immense range which we have before spoken of as dividing the Peninsula.

By the experiments of the Abbé Nollet, it appears that the electric fluid has the

(1) The Pylney Mountains have repeatedly been mentioned, in this Report, as having been supposed, by a great majority of the natives, to be the positive source whence sprang the epidemic fever. But while there was one great cause (irregularity of seasons) operating so universally, and extending to all the districts, we cannot suppose that there was but a single point whence the mischief was diffused; though we think it by no means unlikely, considering the peculiarly mountainous and woody nature of the Pylney division of the Dindigul country (where the hills are of an immense height, and the range so deep as to join the Western Ghauts), that the disease there may have attracted notice at a very early period.

power of accelerating the growth of vegetables; and Dr. Wilson[1] makes no doubt but that it promotes putrefaction in animal bodies: it may, therefore, here become a question, how far this fluid, which, we have noticed, was very abundant in the atmosphere during some of the most unhealthy periods, may not have assisted in producing a distempered state of the air.

The predisposing causes of remittent and intermittent fever are well known to be those that operate by producing debility; such as poor or insufficient diet, great fatigue, frequent exposure to cold and damp without proper covering, habitual inebriety, grief, sorrow, and mental anxiety; in short, whatever exhausts or diminishes the powers of life: and hence it is, in the present instance, that we find the disease has invariably been most fatal

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(1) See *Dr. A. Wilson's Observations on the Influence of Climate*, pp. 18, 19.

in such villages as stand low, or in the vicinity of marshy lands, and amongst the poor and hard-working inhabitants, who are ill fed, badly clothed [1], and miserably lodged: and perhaps this cannot be better exemplified, than by stating, that at Madura, in a period of sixteen months, up to the 1st of April 1811, there did not happen one casualty amongst the troops of that station, though the poor inhabitants of the garrison were very unhealthy during the same period. Again, at Dindigul, out of three companies usually stationed there, but two deaths occurred from the 1st of March, 1810, to the 30th of November of the same year; though the needy inhabitants of the town, who were comparatively worse fed and clothed, were dying by hundreds. And at Daraporam, while the epidemic was at its greatest height, the prisoners in jail there, who were well

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(1) *Malthus*, in his *Essay on Population*, observes, that all epidemics make their principal ravages amongst the lower classes. Vol. II. p. 59.

fed and lodged, in a high, dry, sheltered situation, suffered but in a trifling degree.

Supposing, then, that there exists in the atmosphere the remote cause of epidemic fever, and that there has also been superinduced a predisposition to be acted upon by it, there are still another set of causes, termed *exciting*, which often hasten the approach of the pending evil: perhaps the most certain of these are, exposure to cold and damp, while the body has been relaxed by preceding heat, and the influence of ardent solar rays on an irritable frame.

The bad effects of the last are self-evident; the mal-influence of the first has been noticed by many writers of distinction, particularly by Pringle[2] and Bursarius[3]; and it appears to have proved the certain source of incalculable mischief

(2) See his *Diseases of the Army*, p. 76.

(3) See *Bursarius's Institutions of Medicine*, vol. I. p. 230.

in those provinces in which, during the months of March and April 1811, the nights were extremely sultry, and the dews, which by this time should have ceased to appear, still fell in great abundance. "The heat of the early part of the night," says Mr. Hepburn, in a letter to the Revenue Board, "induced many of the natives to "sleep in the open air; by which means "they became exposed, while perhaps still "perspiring, to the chill fogs and damps "of the morning; and which, in all pro-"bability, was the cause of the fever which "ensued."

But if such fogs and damps can be productive of consequences of so serious a nature in an open country, it is but reasonable to suppose, that in the neighbourhood of mountains, thickly clothed with wood, they must prove a still more certain cause of evil: and so it is that we have, in every instance, found the epidemic most prevalent in situations close to

the hills, where, as BONTIUS has justly observed[1] (when speaking of Batavia), there is but too often breathed, about the dawn of day, cold, noxious vapours, the more certainly dangerous, by their succeeding to the "tepid" warmth of the night.

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(1) See *Bontius's Account of the East Indies*, p. 100.

Section V.

Nature of the Epidemic, and its various Types—The Notions of the Vytians or Tœmool, Medical Practitioners, respecting it.

The disease which has proved so fatal in the southern provinces does not differ in its nature from the common endemic fever of this country (India), which, at certain seasons[1], and in peculiar situations[2], may be every year met with: its having been rendered epidemic, on the present occasion, is altogether to be ascribed to the causes[3] we have already mentioned.

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(1) The most unhealthy season, in these districts, is from the time that the N. E. monsoon rains cease, to the middle of May.

(2) Such as amongst the hills in the Ganjam Circars, amongst those near Palavarum, in the Rajamundry district, &c.

(3) Dr. John Clark, in his *Observations on the Diseases of Long Voyages,* says, Remittent fever may occur at any time, but seldom rages epidemically, except in close, moist, and sultry weather. See vol. I. p. 157.

Pringle has told us, that intermittents are "the great endemic" of marshy countries, and that they rage most in hot summers, during a close and moist state of the air: but he might as well have added, of woody and mountainous countries; which are so well known in this part of the world to occasion the malady we now treat of, that in the more northern parts of Hindostan it is called the "Jungle fever," and on the Coromandel coast the "Hill fever."

This disease, as in the West Indies, is either remittent or intermittent, according to circumstances of constitution, management of the patient, or season of the year; but we are happy to say, that the second is by far the most common. Delicate people, of naturally irritable habits, or who have rendered themselves so by irregularities or want[4]

(4) Some of the worst cases of remittent fever amongst Europeans, which we have known, appeared to have been brought on by the habit of quacking, and taking frequent calomel purges; than which nothing can be more injurious to the digestive powers, nor more likely to predispose the body to receive the fever.

of care, are sometimes attacked by the disease in its remittent form, which either proves bilious, or nervous, as the constitution inclines. The same happens to those, who, with even stronger frames, and what has been termed a phlogistic diathesis, have been injudiciously treated at the commencement of the disorder; for instance, by having bark given them too freely, before proper evacuations had been procured: and it has also been observed by us, that, as the season became hotter, the fever was more apt to put on a remittent form, than at an earlier period, while rains perhaps were falling, and the atmosphere comparatively cool. In confirmation of what we have ourselves witnessed in this respect, we shall add, that this peculiarity has also been called to our attention by a well-written communication from Mr. Abercromby, surgeon of his Majesty's 34th regiment, to Mr. Boswell, Superintending Surgeon of the Hydrabad Subsidiary Force; and we find that both

Hillary[1] and Dr. Maclean[2], in their works on the Diseases of Barbadoes and St. Domingo, have made similar observations.

The more robust have been usually seized with fever of the intermittent kind; and, by every account we have received, it appears that males have suffered more than females, and young people and those of middle age more than old men and children.

The epidemic fever, when it assumes the remittent form, sometimes comes on very gradually: the patient, for two, or even three days before, being confined to bed, feels himself much out of sorts; his appetite fails him; he has a slight squeamishness at stomach, particularly on seeing animal food; he complains of a feeling of universal lassitude, and of alternate heats and chills;

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(1) See *Hillary's Observations on the Diseases of Barbadoes*, p. 91.

(2) See *Dr. Maclean's Inquiry into the Nature and Causes of the Great Mortality at St. Domingo*, pp. 86, 87.

there is a stupid heaviness, if not a pain, in the head; the eyes are clouded, the ears ring, and the bowels are invariably costive. In other cases, the approach of the enemy is more rapid; and rigors, great prostration of strength, vertigo, sickness at stomach, or vomiting, sooner ensue, and never fail to usher in the disease.

The first paroxysm, which is often attended with delirium, and sometimes in young people is accompanied by a bleeding at the nose, after having continued for a certain period with symptoms varying according to the strength of the habit and constitution of the sufferer, terminates in a sweat; not, however, of that profuse and fluent kind which succeeds to the hot fit of a regular ague, but clammy, and sometimes indistinct: it, however, has the effect of lowering the pulse, and cooling the body; but neither the natural feeling of the skin, nor the proper state of the pulse, are thereby induced: the former gives a sin-

gular, dry, and uncomfortable sensation to the touch, and the other is smaller and quicker than it ought to be; the patient continues languid, and has but little appetite for food.

If proper steps are not now taken to bring on a regular intermission, or if, from the violence of the disease, it cannot be done, this first remission will not be of long duration[1]; a paroxysm more severe in every respect soon ensues, usually ushered in by vomiting (in some cases of bile), and quickly followed by excessive heat of skin, delirium, great thirst, difficult respiration, and a most distressing febrile anxiety; and the tongue, which at first was only white and foul, now begins to look parched and brownish. The next remission, when it takes place, is less perfect than the first, and brings still less relief; and in this way, if a check cannot be given to the fever, or if (which they sometimes do) natural loose bilious evacua-

(1) Not usually longer than from five to eight hours.

tions do not occur to supply the place of diaphoresis, it will run its fatal course, each succeeding attack proving worse than that which preceded it, till nature, exhausted at last, begins to give way: the pulse gradually loses its strength, the countenance shrinks and looks sallow, the eyes become dim, the abdomen swells from visceral congestion, and the stomach lothes every sort of food: shortly after this period, hickup comes on, an alarming stupor succeeds to low delirium, and death quickly closes the scene. But such severe remittents have not been very frequent in these provinces; and when they did occur, were, we believe, mostly occasioned by neglect or unpardonable blunders at the beginning of the disease.

The intermittent form of the epidemic is infinitely more common, and much more tractable. Dr. Fowle[1], as well as Dr. James

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(1) See his *Practical Treatise on the Diseases of the West Indies*, pp. 1, 2.

Clark[2], have told us, that the rigor in such cases, in the West Indies, is not so great, in proportion to the succeeding, as it is in England: we cannot say, however, that we have observed any such peculiarity in this country; the cold stage[3] here is often of long continuance; and most distressing vomiting frequently takes place at the beginning of the hot fit, and is sometimes succeeded by delirium.

Agues of all kinds either commence at once with rigor, or a shaking fit; or they first shew themselves with a febrile attack, more or less continued, and usually of about two days' duration: this, on going off, by means of the usual remedies, leaves the patient, for the most part, tolerably well, and he continues so for a short time; after which the fever returns, and observes the type which is to distinguish it.

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(2) See his Treatise *on the Yellow Fever of Dominica,* pp. 92, 93.

(3) Its duration is commonly from half an hour to nearly two hours.

With regard to the question, How far this epidemic ought to be considered as contagious? we have no hesitation in saying, that we believe it *not* to be so, in any of its natural forms; whatever might happen in cases which, from improper treatment, had been allowed to pass into low continued fevers, attended with the usual symptoms of putrescency; though, even then, contagion could never extend far in a country like this, where the general heat of the air seems peculiarly hostile, as well to its first production, as to its spreading; and where the free admission of fresh air could not fail quickly to break and dissipate its circle.

The types under which the intermittent has appeared, are the following:—1st, The simple tertian. 2d, The double tertian, which would seem to consist of the junction of two single tertians, that run each a separate and independent course, with similar paroxysms on alternate days. 3d, Quotidians. 4th, Quartans; and, 5th, Irre-

gulars. To shew which of these has most frequently occurred amongst the natives, during the present sickness, we cannot do better than here subjoin a report of the Sick in the Regimental Hospital of Dindigul, taken on the 1st of June 1811; the effective strength of the detachment being then 255 men.

Simple Tertians.	*Double Ditto.*	*Irregulars.*	*Quotidians.*	*Quartans.*	*Convalescents.*	*Total.*
30	26	24	13	4	20	117

Of these, 53 had been in the hospital for one month, 39 for two months, 23 for three months, and 2 upwards of three months.

From the above, it will appear that the simple and double tertian types were the most common at Dindigul: and we learn from Dr. Jackson[1] and Dr. Cleghorn[2], that

(1) See *Dr. Jackson on the Fevers of Jamaica,* page 13.
(2) *Cleghorn's Diseases of Minorca,* page 163.

they were also those which were most frequently met with in Jamaica and Minorca.

Mr. Senac has denied that there is any such thing in nature as a regular quotidian; and Dr. James Clark[1] says, that he never saw a case of it in Dominica: we cannot, however, doubt of its existence in this country; where, on the contrary, when it does occur, it is invariably well marked, with paroxysms returning at nearly equal periods. Though the cold fit by no means continues so long as in the simple tertian, it is a distressing affection; from the circumstance of the disease, in this form, often attacking those of weak constitutions, and by leaving but little time for taking the bark: it is also, perhaps, sooner apt, on this account, to occasion visceral obstructions and œdematous swellings than any other form of the disease.

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(1) See *Dr. James Clark's* Treatise *on the Yellow Fever of the Island of Dominica.*

The quartan type is rare, but we have invariably found it very obstinate; and it frequently, on that account, brings on a morbid state of the spleen, and consequent dropsy. Pierre Campet[2], in his "Maladies Graves de la Zone Torride," makes similar observations. He says, that, in many instances, in the West Indies, "this form of the intermittent fever succeeds a tertian, when badly treated; by "which means the morbific humour is "thrown upon the abdominal viscera."

The irregular disease, by observing no exact periods, is very troublesome; and seems to us to correspond in its nature with what Hoffman has called the Semitertian. The types of fever are sometimes changed during the course of the malady: the conversion of a remittent into a tertian is favourable to the patient, as is that of a double tertian into a single one. Tertians, on the other hand, are sometimes unfortu-

(2) See *Maladies Graves de la Zone Torride*, p. 96.

nately, by mismanagement, turned into remittents, irregulars, or even continued fevers; as are tertians into double tertians, quotidians, or quartans.

The Vytians, or Tamool medical practitioners, ascribe the epidemic fever chiefly to two causes;—a superabundance of moisture in the air and earth, and the bad quality of the water which they have, in consequence, been obliged to drink, owing to unwholesome solutions. To intermittent fever they give the general name of *Sheetah jorum*, or, in more common language, *Coolloor cajil*. The most dangerous type, they are of opinion, is the quotidian, or *Woodada jorum*; but we are inclined to think that they often confound this with remittent fever, for which, however, they have a particular appellation, *Tava jorum*[1], which signifies a

(1) This name is also given, but improperly, to typhus fever, which the better informed call *Kistnah Doshum*. It is much dreaded among the Hindoos, from a supposition that it never takes place but to mark the displeasure of Heaven for the commission of some heinous crime.

fever accompanied with excessive thirst. The tertian type they distinguish by the name *Moonamooray jorum,* and the quartan by that of *Nalamooray jorum.* They allow this last to be of a most obstinate nature; and often have more faith in a change of season for its removal, than any medicine they can administer.

Section VI.

The Mode of treating the Disease, which has been found the most successful—with Cautions regarding the best Means of preventing Relapses.

When the epidemic first shews itself, which it frequently does by a regular attack of an intermittent, we lose no time, on the body's becoming cool, in clearing out the bowels, by administering a brisk purge; which may either be, twenty-six grains of fresh-powdered jalap, and a scruple of crystals of tartar well rubbed together; a full dose of sulphate of magnesia and manna; or an ounce of castor oil. Soon after the medicine [1] has ceased to operate, we pre-

(1) Pills composed of calomel and rhubarb, or calomel and compound extract of colocynth, may also be used for this purpose; though, when there appears to be considerable nervous irritability, we are unwilling to give mercury. The strength of the purging pills may be, for a full-grown person, five or six grains of calomel, and a scruple of rhubarb, made into six pills; or six grains of calomel, and twelve of compound extract of colocynth, made into four.

scribe the cinchona: and there is to be observed this general rule respecting it, that the nearer the time of giving the last dose of the bark for the day is brought to the period of the attack of the cold stage, the more likely will it be to accomplish the purpose intended. From six to eight drachms of the fresh-powdered bark, taken in substance, will commonly be sufficient to keep off a fit; but we have known many cases in which a drachm or two more was required: and we think, that when the whole can be given within the last five or six hours before the return of the shaking-fit is looked for, it is more likely to prevent its actual recurrence, than when taken in smaller doses, and at longer intervals. Some stomachs, particularly in native habits, cannot bear the bark in plain powder: in such cases, we have found it beneficial either to add a small portion of ginger to each dose, or to substitute the infusion or decoction for the substance; adding to it a certain quantity of the tincture, and a little aromatic confection. The whole of the fol-

lowing, taken in divided doses before the time that the fit is expected, will often prove successful:

℞	Infus. cinchonæ . . .	℥x.		
	Tincturæ ejusdem . . .	ʒvi.		
	Confect. arom. . . .	℈i.	Misce.	

The bark in substance, although it has, in some habits, an opening quality, in others proves quite the reverse: to obviate the last, which must ever, in cases of fever, be attended with bad consequences, we generally add a few grains of rhubarb to each dose; or, what answers just as well, and without irritating the stomach, we recommend the use of laxative injections. Any purging effect from the cinchona may be easily prevented, by adding four or five drops of laudanum to each dose. At the commencement of the hot fit, benefit is often derived from thirty or forty drops of the medicine just mentioned, given in a small glass of water, in conjunction with half a drachm or more of the *alcohol am-*

moniatum aromaticum, or with half an ounce of the *aqua acetatis ammoniæ*. This appears not only to have the effect of shortening the fit, but of sustaining the strength of the patient, and enabling his stomach to bear the bark. When the perspiration begins to flow, the drink[1] ought to be taken tepid; but during the time that the skin is dry, and the temperature of the body at its greatest febrile height, cold water may not only be taken with safety, but we think with advantage.

The bark is not to be immediately left off on the fever disappearing from its use, but ought to be continued for eight or ten days, effectually to prevent or break a habit of recurrence; and for this purpose, three, four, or more doses, on the days

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(1) Barley-water, rice-gruel, or, what is very pleasant, an infusion of lemon-grass (*Andropogon Spec.*), are the most proper. For old people, or those of cold and delicate constitutions, a good sustaining drink, during the sweating stage, may be made with a pound and a half of a warm infusion of sage, and a drachm of the *aqua carbonatis ammoniæ*.

the fever used to return, will be quite sufficient.

Much has been said with regard to the propriety of giving repeated purges, in cases of intermittent fever; and there are some practitioners, in this country, who are in the habit of ordering them very freely. However necessary we deem it to be, that the bowels should in every instance be kept perfectly open, and that over-secretions of bile should be carefully worked off, we are altogether inclined to distrust the frequent use of strong remedies of this class; not only as we have known them, from our own experience, to be productive of certain mischief, by occasioning irritation, debility, and ultimately an obstinate disease, but as we are mindful of the lesson that was taught us early in life, by the writings of the judicious Hoffman[1], who particularly recommends, that in agues the bowels should be kept open by the gentlest laxatives, given with the bark, or by clysters.

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(1) Vide *Med. Rat. Syst.* Pars I. cap. 1.

Slight enlargements and indurations of the spleen will sometimes be felt, after attacks even of the most regular intermittents; and in habits otherwise sound, such affections are of little consequence, and commonly disappear rapidly, on the disease taking its final departure, without further precautions than attention to proper diet, and the state of the bowels.

We have hitherto been supposing that medical aid has been sought (as it ever ought to be) at the very commencement of the disease; when prompt recourse to the bark, after free evacuations have been procured, will often put an entire stop to the disorder: but, unfortunately, this is not always the case. The fever has perhaps been allowed to run its course[2] for days together, without any thing having been

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(2) This, we have no doubt, has been the chief cause of the great mortality occasioned by the epidemic fever; as thousands, in remote situations, where no medical aid was at hand, must have had their constitutions ruined before they could receive the smallest relief.

done to check it: on the contrary, improper food may have been taken, bile pent up, spirituous liquors drunk; in fact, every thing done, which ought not to have been done: the consequence of which must be, that abdominal congestion, and obstruction of the greater viscera, soon take place, and an obstinate and dangerous state of the disorder is thereby most certainly induced.

In such distressing circumstances, there is often but little immediate advantage to be expected from medicine, without, at the same time, having recourse to a change of climate (as has been strongly recommended, in similar cases by Dr. John Hunter[1], in his valuable Observations on the Diseases of the Army in Jamaica); then calomel[2] will in many cases be found of great service, particularly if the habit is still pretty strong;

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(1) See his work, pp. 214, 215.

(2) About four or five grains, made into two pills; one of which is to be given at night, and the other in the morning. Should these purge too much, half a grain of opium may be added to the whole, or a grain, if necessary.

and the bowels firm. On the mouth becoming affected with the medicine, some of the most unpleasant symptoms will in all probability disappear; when the bark, should it still be necessary, can be administered with more safety.

There are a description of medical men in this country, who suppose that, in hot climates, bark given for intermittent fevers has the effect of bringing on abdominal obstructions, if calomel is not at the same time daily administered; but to this opinion we cannot, from our own experience, subscribe. If full and proper evacuations are procured at the commencement of the disease, if over-secretions of bile are purged off, and if great care is at all times taken to keep the bowels open, we see no good reason why this acrid mineral should be given, however necessary it may be to alter the habit in more serious attacks;—it is an irritating and debilitating medicine; it is very apt to sicken the stomach, and produce dyspepsia; and must therefore prove

particularly objectionable at all times in delicate habits, and often in others too, when we should, as much as possible, preserve the tone of the stomach, and prevent it from rejecting the bark.—No: obstructions of the nature above mentioned, we are rather inclined to think, arise from other causes; such as, a neglect of timely and free evacuation by stool, and perhaps more certainly still from repeated, long, and severe cold stages having been allowed to take place, before the malady was checked: and hence the almost constant affection of the spleen or liver, which we see consequent of obstinate quartan agues, and which was particularly instanced in the native hospital of Dindigul. In support of what we have here advanced, we shall bring the authority of one of the most enlightened physicians of the present age, Dr. Jackson[1], who, in speaking of bark, says: "I was "early aware of these objections; and

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(1) See *Dr. Jackson's Treatise on the Fever of Jamaica*, pp. 317, 318, 336.

" watched narrowly, that I might discover " its real effects: and I am now warranted " in saying, that it has every right to be " considered as a *specific* in ague and fever, " while it is totally free from the imputa- " tion of occasioning dropsy, dysentery, or " visceral obstructions: these complaints " were always the most frequent when " this remedy had been the most sparingly " employed."

We not unfrequently meet with very obstinate cases of intermittent fever, though apparently unaccompanied by any peculiar derangement of the abdominal viscera: in such cases, so inveterate is the habit of recurrence, that no quantity of bark that can be taken seems to have any good effect: against these, many remedies have been used with various success.

We have occasionally tried with advantage the vitriolic æther, as recommended by Mr. Davidson, in the 5th volume of the "Medical Facts and Observations," to the

quantity of a drachm and a half, on the approach of the cold fit; and we have also known benefit derived from a full dose of laudanum, given about an hour before the attack; a practice first taught us by the excellent Dr. Blane[1].—In favour of the use of white vitriol in agues, we cannot say much: we learn from Mr. Hastie, that he gave it a fair trial in the hospital at Dindigul, in May last; but he thought, although in a few instances it[2] appeared to do good, that it was apt in others to produce much general uneasiness, head-ache, nausea, and a most disagreeable sensation at the upper part of the œsophagus.

An emetic, given a little before the cold fit was expected, has occasionally kept it off.

Arsenic, which for some years past has come much into vogue in England, has

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(1) See his *Observations on the Diseases of Seamen*, page 444. Third edition.

(2) It was given in the quantity of about three grains every hour, commonly about twelve hours before the attack was expected.

been used by the Hindoo medical practitioners from time immemorial, and they have great confidence in its virtues in intermittent fevers: we have been in the habit of occasionally prescribing it in solution, as recommended by Dr. Darwin, to the extent of eight drops three times in the day; but we do not much approve of the practice; though we must add, that we have, in some instances, seen it succeed in putting an entire stop to the disease, when many other things had failed.

In recommending the use of the cold effusion during the hot fit, we can speak without hesitation, being firmly of opinion that it is a very powerful remedy; and what frequently, when judiciously used, arrests the progress of the intermittent;—nay, we have, in several instances known daily immersion in the sea prove the happy means of checking agues which had baffled every other exertion that had been made to conquer them.

A blister applied to the nape of the neck will often prevent the recurrence of the cold fit; and in cases of great debility, when the stomach rejected almost every thing, we have seen the patient saved by having a warm plaster laid over his stomach, and taking large doses of tincture of bark, each dose containing six or eight grains of ginger; or the bark, in such cases, may be given in an infusion of ginger; or, what we have occasionally found prove very beneficial, powdered ginger may be taken in an infusion of the *Creāt root*[1].

Notwithstanding all these remedies, however, the disease will sometimes prove[2] very

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(1) *Justicia Paniculata.* See *Dr. Ainslie's Materia Medica of Hindoostan.*

(2) Mr. Tait, Garrison Surgeon of Trichinopoly, whose professional talents are well known, has informed us, that in obstinate cases of intermittent fever, when he had tried every thing else that has been had recourse to on such occasions, in vain, he had succeeded in checking the disease, by giving at bed-time a full dose of the *Elixir Sacrum*, or, as it is now called, the *Tinctura Rhei et Aloës.*

obstinate; and, if not checked, run on to coma, and death. In such cases, calomel, or the blue pill, continued till the mouth is a little affected, even when no obstruction has taken place, is often found to be of the greatest service;—not so much by putting a stop to the recurrence of the attack (for in accomplishing this end it frequently fails[3]), but by inducing a new action, and thereby bringing about so great a change in the habit of the patient, that the cinchona, which previously had been given in vain, will now be administered with success.

In the latter periods of long-protracted cases of intermittent fever, particularly if free evacuations had not been procured in the earlier part of the disorder, distressing and alarming bowel affections often take place, —not attended with much straining, but of an obstinate and debilitating nature. Gentle opiates, given in weak cretaceous mixtures,

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(3) We know several instances of the fever continuing to recur while the mouth was affected by the mercury.

made cordial by means of some aromatic, are sometimes of service in such cases; but attacks of this kind prove but too often fatal, particularly amongst the natives.

Œdematous swellings, and ascites also, not unfrequently supervene from pure debility. These, when no particular abdominal enlargements or obstructions have taken place, are best treated by repeated small doses[1] of tincture of squills, given in conjunction with a little ginger and tincture of bark; having recourse, at the same time, to frequent friction with dry flannel, and proper attention to the ingesta: but should the bowels be altogether firm, and there is any reason to think that the dropsy arises rather from visceral congestion than weakness, calomel must be given, in conjunction with the powder of squills, in small repeated

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(1) ℞ Tincturæ scillæ, gtt. x.
Tincturæ cinchonæ, ʒij.
Pulveris zingib. gr. viij.
Aquæ fontan. ℥iſs.
Misce. Fiat mistura, ter indies sumenda.

doses; or, what may be safer, as less likely to bring on flux, the common mercurial pill, with the addition of the dry squill powder. The following we have ordered with advantage:—

℞ Pilulæ hydrarg. gr. vi.
Pulveris scillæ siccat. gr. ij.
Misce. Fiant pilulæ duæ. Sumatur una bis indies.

These may be continued for a longer or shorter period, according to circumstances; adding, should it be necessary, a little opium; and, at the same time, paying the strictest attention to proper diet, and the use of dry friction.

When any person is seized with remittent or intermittent fever, who has previously suffered much from liver affections or dysentery, and who may still have diseased abdominal viscera, a most complex and dangerous morbid condition may be expected, requiring the nicest treatment, as each succeeding attack but too surely aggravates the old derangement; and the uncer-

tain state of the bowels is as certainly discouraging to any great hopes we might entertain from the use of the bark. In such a predicament, indeed, this medicine is to be given with great caution; and the decoction or infusion, with the addition of a little of the tincture, are to be preferred to the substance. But, when there is much uneasiness or pain in the right side, even these should be desisted from: a blister, without loss of time, should be applied to the part affected, and mercury had recourse to. At such times, however, as the bowels are often much out of order, the following, persevered in for a short time, we think infinitely preferable to plain calomel, as an *alterative,*—to use a word now wearing out of fashion, for want of a better to express the effects often happily produced on the human frame, by administering this extraordinary mineral:—

℞ Pilulæ hydrarg. gr. vi.
Pulver. ipecac. gr. iij.—iv.
Opii, gr. ſs.
Fiant pilulæ tres. Sumatur una ter indies:—

resuming the use of the cinchona, if required, after the hepatic symptoms are removed. In other cases, if the attacks of fever continue to recur, we have even given it at the same time with the pills, especially if the liver complaint was altogether chronic, and the uneasiness in the side very slight.

Sometimes, in complaints of this nature that have remained obstinate, we have known an issue in the right side of great service; together with a judicious course of bitters and gentle tonics. We say *judicious*, because we are aware that *mischief* is often done by an indiscriminate use of these remedies.

A change[1] of air we have constantly found so beneficial in promoting the re-

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(1) Celsus had so high an opinion of the benefit to be derived from a change of air in many complaints, that he says, rather than not change it, it is better to go from air, ascertained to be good, to a bad climate.—Vide *Celsus*, lib. ii. cap. 1.

covery of all such as have been attacked with remittent or intermittent fever, that we never fail to recommend it to those who have it in their power to try it.

It is almost needless to add here, how much diet ought to be attended to in the cure of fever. All crude vegetables and austere fruits are to be cautiously avoided; as should also food of what is commonly called a heavy nature, or that is difficult of digestion. Light puddings, clear broths, and bread or rice, are proper: on the well days, a little tender animal food, with two or three glasses of sound Sherry[1], or (what is perhaps better) brandy and water, made weak, may be safely taken. Gentle exercise is useful: and some people, particularly such as are subject to hepatic affections, often derive much benefit from wearing flannel next the skin, which prevents any bad consequences from sudden

(1) There is an acidity in Madeira wine, which, in such cases, must be avoided.

chills, and keeps up a nearly uniform temperature on the surface of the body. Above all things, the state of the bowels is particularly to be attended to, and excess of every kind carefully shunned.

Regular intermittent fevers are not unfrequently ushered in by a febrile attack, more or less continued, and usually of one or two days' duration. In such cases, we prescribe an emetic[2], if the state of the stomach admits of it. After its operation has ceased, we evacuate the bowels by means of a smart purge; and for this purpose nothing answers better than a full dose of the compound powder of jalap, salts, and manna, or jalap and calomel; giving, on the evening of the same day, a

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(2) This may either be of tartar emetic, or ipecacuanha: a scruple or 15 grains of the latter will be sufficient. The first is best given in small divided doses.

℞ Mistur. salin. lb. i.
Tart. antim. gr. iij.

Misce. Assumatur ℥ifs. omni quadrante horæ, donec vel excitatur vomitus, vel alvus solvatur

draught prepared with half an ounce of the *aqua acetatis ammoniæ,* two drachms of common syrup, and thirty drops of laudanum; or one composed of one drachm of antimonial wine, and as much of the *spiritus etheris nitrosi.*

Should the patient still continue so feverish as to prevent his using the bark in the way already recommended, he may take the following, in doses of an ounce and a half, every two hours:—

℞. Mistur. Salin. lb. ifs.
Tart. antim.—gr. ifs. Misce.

Or it may be prepared without the emetic tartar, adding, instead of it, half a drachm of purified nitre.

When, from the appearance of the symptoms formerly described (in Section V.), it is evident that a fever of the remittent kind is expected, the stomach is often in so irritable a state, that it would

be highly improper to give an emetic. In such cases we order at once the following pills :—

> ℞. Calomel, gr. vi.
> Pulv. Jacob. gr. vi.
> Misce. Fiant pilulæ tres :—

the whole of which may be taken in the course of the twelve hours. These will produce copious evacuations; and may also, perhaps, bring on a degree of diaphoresis; which ought to be encouraged, by taking frequently a little tepid drink. On the second day, when the paroxysm will, in many cases, be found every way more severe [1] than on the first, no time is to be lost in having recourse to mercury; the remedy which, at such times, can best be relied on for producing a proper intermission. Seven or eight grains of

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(1) At this period of the disease, we have, in some instances, been able to check its further progress by means of the cold affusion; while, in others, it altogether failed in producing the desired effect.

calomel, with three grains of camphor; are to be well rubbed together, and made into four pills, one of which is to be taken every three hours during the day. These will often have the desired effect, if continued[2] for two or three days, by producing a desirable change in the habit, and so favourable a remission or intermission of fever, that the bark can be given with safety.

Notwithstanding this mode of treatment, however, we have found that, in some instances, the epidemic fever, in its remittent form, has proved a very severe and dangerous disease. Should no positive advantage appear to have been derived from

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(1) There appears to be something in the nature of camphor, which peculiarly fits it for being given in conjunction with calomel: it mitigates, in some measure, the acrimony of this mineral, tends to calm the nervous system, and gives the fluids a tendency to the skin.

(2) The length of time to continue the pills must, of course, depend upon the habit of the patient. It will be necessary to administer them till the gums are a little affected, but not the length of painful salivation.

the use of the pills just mentioned, although the gums shew evidently that the habit has been affected by the mineral, we think it advisable no longer to delay the use of the cinchona, even before a regular intermision has been obtained, as the surest means of sustaining the strength of the sufferer. The decoction, or infusion, with a small portion of the fine powder in it, and a little of the tincture, will then be the best form; giving, from time to time, what light nourishment[2] can be taken: or the pills of calomel and camphor may be given during the night, and the bark by day, in the way just mentioned; taking care, should nature appear to be sinking, to endeavour to raise the vital

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(2) With regard to wine, we must recommend that it be given with great caution in every instance of remittent fever: and if it appears, in the *smallest degree*, to increase the febrile heat, or excite delirium, which it often does, it is altogether to be abstained from; for it will then certainly do infinite mischief: it is safer to abstain from it altogether, till the fever has totally disappeared.

energy, by means of blisters to the legs, feet, or back. Indeed, in all extreme cases of this malady, blisters are often of great service, by rousing to recollection, and exciting the vis vitæ The bowels are to be kept open by mild injections, to save the stomach; and grateful, but light cordials, are to be united with the bark.

Relapses of the epidemic fever, in all its forms and types, have been extremely troublesome. These seem to be in a great measure occasioned by the habit of recurrence that has been acquired during the course of the disease: they are apt to happen, too, on any particular change of the weather, or to be brought on by irregular living, repletion, fatigue, cold bathing in damp weather, or improper exposure to the heat of the sun or dews of the night. Costiveness, pent-up bile, and indigestion, we have also known frequently to induce a return of the disorder, when it appeared to have taken its final departure.

With regard to the moon producing relapses of fever, we cannot speak with much confidence. This influence was first taken notice of in India by Dr. Lind, many years ago; and, since his time, more particularly, by Dr. Balfour, who has written on the subject. The latter is of opinion, "that the three days which precede and "the three days which follow the new or "full moon are remarkable for the in-"vasion and relapses of fever; that the "day of the full moon, and the day of "the change of the moon, are the most "remarkable of all; and, further, that the "days which follow are, in general, more "remarkable than those which precede[1]."

It is singular, that, by Dr. Jackson's own observations in America, it appeared, that the four days preceding[2], not following, the full moon were more particularly distinguished for febrile attacks. These diffe-

(1) See Dr. *Jackson's Treatise on the Fevers of Jamaica*, p.95.
(2) Ibid. p. 98.

rences impress us with doubts on this point—doubts still more strongly felt, from a further knowledge of opposite opinions and conclusions, which we shall here mention.

The excellent Dr. James Clarke[1], long a most accurate observer in the West Indies, says, that he ascribes those periodical returns of intermittent fever rather to a certain habit contracted in the constitution, than to any influence of the moon on the body. On the other hand, Mr. Hastie, in a letter addressed to the President of this Committee, has these words:—" About two days before " the change of the moon took place last " month at Dindigul, relapses of fever were " frequent amongst the convalescents."

But then, again, in a communication which the President of the Commitee received some years ago from Mr. Currie, a young man of great medical research, and

(1) See his *Treatise on the Yellow Fever of Dominica*, p. 96.

now Surgeon to the Residency of Hydrabad, we learn, that by a correct account of attacks and relapses of fever in the Hospital of the 1st Regiment of Native Cavalry, during a period of two years in the ceded districts, Mr. Currie clearly ascertained, that, so far from a greater number of relapses or attacks happening at or near the full of the moon, they were least common at those times.

To prevent relapses of fever, we know nothing so likely to be of advantage as a change of air, particularly by a sea voyage. To effect the same happy purpose, great attention to the state of the body is absolutely necessary. Taking occasionally a little tincture of bark, together with a small quantity of that of the *Creāt-root*, will be of service; and nothing can more certainly be so, than carefully avoiding every kind of excess.

Soon after the appointment of this Committec, wc had occasion to regret that

much mischief evidently arose from a deficiency of medical aid in many of the smaller villages and remote corners of the southern provinces; and then called to the attention of the Medical Board certain short rules, which we thought could easily be followed by the natives themselves, without the immediate attendance of regular Vytians.

We were much gratified to find that what we then recommended was so much approved of by the Medical Board, and subsequently by the Honourable the Governor in Council, that the latter had lost no time in ordering the most prompt obedience to our various injunctions and cautions throughout the whole of the districts in which the fever at that time raged. And we have now the greatest satisfaction in saying, that our advice was not bestowed in vain: many natives in different quarters have acknowledged the great benefit that has been derived from the use of the medicines we brought to their notice, and confess that

they believe them to have saved many lives.

We shall conclude this section by subjoining a list of a few of the many articles which are used by the native medical practitioners in intermittent fever. But first let us testify our great joy at now having it in our power to declare, that, by every account we can obtain, we learn that the epidemic has in a great measure ceased from its work of destruction; and that the few unfortunates who still suffer are merely those who, having escaped with life from the first violence of the disease, are now lingering under the visceral derangements it is but too apt to leave behind.

1. *Vullay Pashanum*, (White Arsenic).—Of this they are in the habit of giving about the fifteenth part of a grain twice daily, rubbed into a fine powder with coarse sugar.

2. The bark of the *Soïmédoo*, (*Swietenia febrifuga*, *Roxb.*)—This is chiefly used by the inhabitants of the Northern Circars. We have, from our own experience, found, that, when taken beyond the quantity of five or six drachms in the course of the day, it produces vertigo, and other nervous symptoms; without being by any means so valuable a medicine, in other respects, as either the *Cinchona*, or bark of the *Vaypoomarum*.

3. The bark of the *Vaypoomarum* (*Melia Azadirachta*).—This bark is very bitter, powerfully tonic, and is much used by the Tamool doctors.

4. The nut called in Bengal *Cāt Carāuja*, and by the Malabars *Cúlláchie Kāie*.—It is the produce of the *Cæsalpina Bonducella*.

5. *Chukkoo* (*Amom. Zingib.*).

6. *Womoo* (*Sison Ammi*).

7. *Sittaretti* (*Costus spicatus, Rottler*).

8. *Tsiragum* (*Cuminum Cyminum*).

9. The bark of the *Caroowelim* (*Acacia Arabica*).—The tree in Hindoostanee has the name of *Babul.*

10. The *Corte de Pāla*, or Tellicherry bark.—It is obtained from the *Nerium Antidysentericum*, and is much used on the Malabar coast.

Section VII.

Observations respecting the Measures that might be adopted, to prevent, as much as possible, the Recurrence of so great a Mortality, from a Succession of Irregular Seasons.

To correct the state of the atmosphere, when it has become noxious, from such causes as we have enumerated, it will be allowed, is not within the power of man; but it must, at the same time, be granted, that this evil will be attended with infinitely worse consequences, under certain circumstances, than under others.

We have observed, in a former section of this Report, that in all low, marshy situations, the epidemic was found to rage with great violence. Hence the propriety becomes evident, that, wherever it can be done with

convenience in future, villages and hamlets should be built on sites that are high and dry. We have also seen, that in many places close to the mountains, which are ill ventilated, or covered with thick jungle, the disease was very prevalent;—a circumstance which leads us to express our opinion, that the greater distance towns and villages are from those high lands, the better chance will those have, who inhabit them, of escaping fever.

It is a well-established fact, that, during such calamitous periods as that which we now with sorrow contemplate, the lower[1] classes ever suffer most; the natural consequence of their not enjoying the comforts which the more affluent can command;—a fact, too, corroborated, on the present occasion, by our having, in every instance, remarked, that those individuals were the most healthy, who were best lodged, fed, and clothed.

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(1) See *Malthus on Population*, vol. II. p. 59.

In the Coimbatore country, where the greater part of the inhabitants sleep on cots, and, in bleak weather, have *cumblies* to cover them, the epidemic fever was comparatively less destructive; as also in the more central tracts of the Tinnivelly district, and particularly in those beautiful and thriving villages on the banks of the Tambarapoornie, where an active and superior race of people seem to receive the just rewards of their labour and industry. How much, then, ought it to be the study of every government, to meliorate, as much as possible, the condition of the inferior ranks! The ample advances of money, that have been made to relieve the distresses of the cultivators in these provinces, testify how well this is understood by the supreme authority at Madras; and we shall take the liberty of suggesting what we conceive ought to be further done, to amend the condition of the native inhabitants.

1st. To give them every encouragement to build their streets wide and regular.

2d. To recommend tiling, in place of thatching, the roofs of houses, to such as can afford it.

3d. To point out the benefit of sleeping on *cuttles* (truckle-beds), instead of lying on the damp ground.

4th, and lastly. To have it strongly urged, to men of all ranks and castes, the advantages that are to be derived, in moist and bleak weather, from being covered with *cumblies.*

It has been remarked by a very accurate observer, Dr. W. Fowle[1], that intermittent fevers, in the West Indies, are ever most common and dangerous in those islands which are least cultivated. Dr. S. Farr[2], in his translation of the *Epidemics* of Hippocrates, seems to have thought so highly of the influence of agriculture, that he has

(1) See Dr. Fowle's Treatise.

(2) See his Preliminary Discourse, from p. 38 to 43.

introduced it as one of the means by which a distempered state of the air may be remedied or prevented; and D. A. Wilson[1], in his valuable Observations on the Influence of Climate, has these words, in speaking of America: — "The European inhabitants, "who were transplanted to that continent, "seemed for a time to degenerate; but the "face of the country being by degrees "changed, from woods and morasses, to a "clear surface and cultivated fields, and, "consequently, from an impregnated to a "pure atmosphere, those appearances have "subsided, and the natural effects have "begun to flow from those changes, "which there was every reason to expect "from its cultivation and climate: and the "more quickly it is deprived of its woody "covering, the more rapid will its improve-"ments be, in every thing that hath dis-"tinguished the European nations in equal "latitudes."

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(1) See his Work, pp. 275, 276.

With such authorities, then, before us, we shall here venture to offer our opinion with some confidence, that nothing is more likely to prove advantageous to the climate of our Indian dominions than the clearing away of jungle, the draining of useless swamps, and an extensive cultivation of waste lands; and we are extremely happy to learn, that, at this very time, these objects occupy the serious attention of the Governor in Council of Fort St. George.

In a communication which we made to the Medical Board, from Bhavanie, in the month of May, we expressed a belief that many deaths had been occasioned by the ignorance of the native medical practitioners, regarding the best method of treating the epidemic fever; and we then recommended, with a view of obviating the mischief thence arising, that the Vytians should attend, for a time, to the personal instructions of such surgeons, or assistant surgeons, as might be stationed nearest to their respective villages. But we have since

thought that a much more eligible method might be adopted, to accomplish the same end,—by a concise and distinct account of the European method of treating fevers, and two or three of the other most common diseases of these countries, being translated into Malabar, and the work distributed amongst the Hindoo doctors.

In a former section, we mentioned our great joy at having had it in our power to say, that the ravages of the epidemic had ceased: and perhaps we cannot better conclude our Report, than by expressing an earnest hope, that what has been advanced by Dr. Short, in his "History of Air and Seasons," as well as by Malthus[1], may, on this occasion, be realized; viz. "That a "severe and mortal epidemic is generally "succeeded by uncommon healthiness."

COURTALUM,
August 27, 1811.

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(1) See *Malthus's Essay on Population*, vol. II. p. 63.

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